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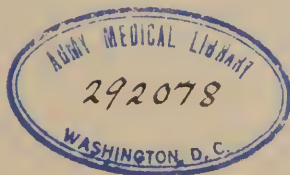
LECTURE NOTES  
—IN—  
OBSTETRICS,

FOR THE USE OF  
STUDENTS IN THE LONG ISLAND COLLEGE HOSPITAL,

—BY—  
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BROOKLYN, N. Y.:  
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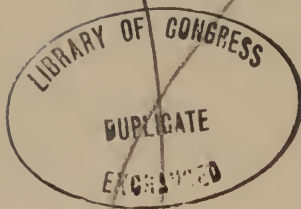


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LECTURE NOTES  
—IN—  
O B S T E T R I C S.

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THE FEMALE GENITAL ORGANS.

1. External Organs of Generation : Pudendum : Vulva.

The **Mons Veneris** is a fatty cushion overlying the upper half of the symphysis pubis. In addition to fat it contains fibrous and elastic tissue. It is covered with skin which abounds in sebaceous and sweat glands and becomes invested with a growth of hair at puberty.

The **Labia Majora** are two prominent, rounded, fleshy folds springing from the mons veneris as if prolongations of its lateral halves, and extending downward and backward to a point about one and a quarter inches in front of the anal orifice. They are symmetrically placed on either side of the median line and lie in contact with each other in the young nullipara. In older women they shrink and the labia minora protrude between them. They are thickest in front and taper from before backward. Their covering is skin. The outer surfaces are supplied with hair, the inner resemble mucous membrane, but are sparsely covered with fine hairs. Both surfaces abound in sebaceous and sweat glands.

They are the analogue of the scrotum in the male. The point of union in front is the anterior and that behind, the posterior commissure. Their internal structure is made up chiefly of connective and adipose tissue and includes a rich venous plexus. The remains of the canal of Nuck may sometimes be traced into them on either side,

- The Labia Minora** are two thin folds of skin or mucocutaneous tissue lying obliquely upon the inner surfaces of the labia majora. Anteriorly each subdivides into two folds, the superior folds uniting in front of the clitoris to form the prepuce of the clitoris, the inferior folds forming, by their junction below the glans, the frenum of the clitoris. They are widest toward their anterior extremity, gradually narrowing from before backward.
- The Fourchette** is a transverse fold of skin uniting the labia majora posteriorly.
- The Fossa Navicularis** is the boat-shaped surface between the fourchette and the hymen, which appears when the labia are separated.
- The Rima Pudendi** is the median cleft between the labia of the right and left side.
- The Clitoris** is the analogue of the penis. It lies in the median line just below the anterior vulvar commissure concealed behind the mucous membrane. It has two corpora cavernosa and a glans, but no corpus spongiosum, and is imperforate. The corpora cavernosa of the clitoris are continuous with the crura, by which it is attached to the ischio-pubic rami. Its length during erection is about one inch.
- The Vestibule** is the triangular space bounded laterally by the labia minora and below by the margin of the vaginal orifice. Its covering is mucous membrane. At its apex is the glans clitoridis. At the center of its base, or immediately above it, is the meatus urethrae in the center of a small tubercle or prominence. The meatus lies three fourths of an inch below the glans clitoridis, and one inch above the fourchette in the nullipara.
- The Boundary Line** between skin and mucous membrane runs along the lateral borders of the vestibule and passes backward around the vaginal orifice just without the base of the hymen.
- The Arterial Supply** of the pudendum is chiefly from the internal pudic.

**The Veins.** The labia, clitoris and urethra abound in erectile tissue rich in venous plexuses. The bulbi vestibuli are two leech-shaped masses of veins about an inch in length and situated one on either side of the mesial line behind the labia, opposite the vaginal orifice and the base of the vestibule. They lie between the bulbo-cavernosus muscle and the vaginal wall, immediately in front of the triangular ligament. They communicate through the pars intermedia of Kobelt with the veins of the glans clitoridis.

**The Lymphatics** of the labia majora, minora and clitoris, terminate in the inguinal glands.

**The Nerve Supply** of the pudendum is derived from the internal pudic. It is especially abundant in the clitoris and the labia minora.

**The Pudental Glands.** Sebaceous glands abound upon the skin surfaces, especially on the nymphae. About half a dozen muciparous glands are to be found in the vestibule, grouped about the meatus urethrae.

**The Vulvo-vaginal Glands,** or glands of Bartholin, are two reddish-yellow bodies about the size of a pea or sometimes larger, lying one on each side of the posterior portion of the vagina, behind the anterior layers of the triangular ligament. They lie partly behind the lower extremities of the bulbi vestibuli. Their ducts, about half an inch in length, run along the inner aspects of the bulbi vestibuli opening just without the base of the hymen at the sides of the vaginal orifice.

### Internal Organs of Generation.

**The Hymen** appears as a septum partially occluding the vaginal orifice, when the latter is distended. When the orifice is closed the hymen protrudes as a loose fold in the vulvar fissure. According to Budin, it is a thinned out prolongation of the vagina itself. Its most common form is that of a crescent, situated at the posterior margin of the vaginal orifice, with its

concavity looking forward. It may, however, be annular, cribriform, or imperforate. It is usually torn at the first sexual approaches.

THE CARUNCULAE MYRTIFORMES are the remains of the hymen torn in labor by the passage of the child. They appear as minute fleshy tubercles skirting the vaginal orifice or its posterior margin.

THE HYMENEAL ORIFICE is, in the rule, nearly circular. The vaginal, in the virgin, a transverse, crescentic slit, the concavity of the crescent looking forward.

**The Vagina** is that part of the genital tract between the uterus and the vulva. Its direction is nearly parallel with the pelvic brim. It is a collapsed tube, its anterior and posterior walls lying in contact. It is attached above to the uterine cervix at about the middle of its length, the lower portion of the cervix projecting into the vagina nearly at a right angle. Its posterior wall is in relation at its upper extremity with the peritoneum, at its lower with the perineal body. At its middle portion it is loosely connected with the rectum. The lower portion of the anterior wall is closely related with the urethra and base of the bladder. The fornix or roof of the vagina is that part of the canal immediately about the vaginal portion of the cervix uteri.

Length of anterior wall is about two and a half inches.

Length of posterior wall is about three and a half inches.

The walls are, however, extremely distensible, and they become permanently relaxed in parous women. The vagina, when distended, has a conoidal shape, the orifice corresponding to the smaller end of the cone.

#### Structure.

Three coats.

Internal, mucous membrane.

Middle, muscular coat, of unstriped muscular fiber.

External, a loose layer of connective tissue. The mucous membrane is arranged in transverse folds or rugae extending laterally from a median ridge on both anterior and posterior walls. The rugae are most marked in the lower portion of the vagina.

Columnæ rugarum are the two median ridges, one on each wall of the vagina at its lower end.

The vaginal epithelium is of the squamous variety.

The muscular coat consists of an outer circular and an inner longitudinal layer of unstriated muscular fiber.

The external coat contains the external plexus of veins.

**The Arterial Supply** of the vagina is chiefly from the vaginal, but also from branches of the uterine artery at its upper, and of the pudendal at its lower extremity.

**The Veins** correspond, but they first form two plexuses surrounding the vagina, one in the external coat, and one immediately beneath the mucous coat.

**The Lymphatics** of the lower fourth of the vagina join with those of the pudendum, terminating in the inguinal glands. Those from the remaining portion of the vagina unite with the vesical and cervical lymphatics and empty into the iliac glands.

**The Nerves** are from the fourth sacral and the pudic of the spinal system, and the sympathetic nerves from the hypogastric plexus.

**The Mucous Glands** are chiefly confined to the lower portion of the vagina.

**The Urethra.** Intimately connected with the lower portion of the anterior vaginal wall is the urethra.

**Situation.** The urethra passes backward below the pubic arch, and upward behind the symphysis

pubis to the bladder. Its lower three fourths is inseparable from the anterior vaginal wall.

Size. Length, one and a half inches. It is largest at the vesical end, smallest at the meatus and is very distensible.

Shape. Slightly sigmoid.

Structure. Is composed chiefly of muscular and erectile tissue.

**Skene's Glands.** Two tubular glands are to be found in the muscular wall of the urethra at its lower end, near its floor, one on either side of the median line, which are known as Skene's glands, so named from their discoverer. Their orifices lie just within the meatus urethrae. They extend upward along the urethra about three-fourths of an inch.

**The Uterus.** The uterus is a hollow muscular organ.

Situation. It is situated in the cavity of the pelvis, between the bladder and the rectum, a little nearer the sacrum than the pubes. Its upper border is nearly in the plane of the pelvic brim, its lower border about opposite the tip of the sacrum. Its long axis is nearly perpendicular to the plane of the pelvic brim. It is, however, extremely movable.

Shape, pyriform, flattened from before backward, more convex on its posterior than its anterior surface, and very slightly anteflexed.

Size, small and undeveloped until puberty, it then attains its full size in about two years.

Length, in the nulliparous adult, three inches.

Width, at the level of the Fallopian tubes, two inches or less.

Thickness, one inch.

Weight, in the nullipara, from one to one and a half ounces.

Regional Divisions. Fundus, body, cervix.

*Fundus*, that portion above the level of the insertion of the Fallopian tubes.

*Body and Cervix.* The portion below the fundus is about equally divided between the body and the cervix.

*Isthmus*, the slightly constricted portion between the body and the cervix.

*The Portio Vaginalis*, that part of the cervix, about one third of an inch in length, which projects into the upper end of the vagina.

The cavity of the body, somewhat triangular in shape in the nullipara, its anterior and posterior walls lying in contact. It has three openings, one communicating with the cervical canal and one with each of the Fallopian tubes.

The cavity of the cervix is somewhat flattened from before backward, and is laterally elliptical, thus having an irregular fusiform shape.

The os internum is the upper,

The os externum the lower orifice of the cervical canal.

In the nulliparous uterus the corporeal cavity is triangular, fundus flattened, cervix conical, and the os externum a mere dimple.

In the parous uterus the cavity is oval, the fundus dome shaped, the cervix cylindrical, and the os externum a transverse slit, with the lips more or less fissured.

#### Structure.

The Mucous Membrane.

*Body* :—About one twelfth of an inch thick; its epithelium is of the ciliated columnar variety, the cilia propelling toward the fundus. There is no submucous layer. It abounds in tubular glands, which frequently are bifurcated. They are obliquely placed and lined with ciliated epithelium.

*Cervix* :—Firmer than that of the body.

The *arbor vitae* consists of two median longitudinal ridges, one anterior and one posterior, each with transverse folds or rugae running obliquely outward. In and between the rugae of the *arbor vitae* are mucous follicular glands known as the Nabothian glands.

The epithelium of the cervical canal is of the ciliated columnar variety almost to the os externum in the adult. The epithelium of the external surface of the portio vaginalis is squamous like that of the vagina.

The Musculature constitutes the greater part of the thickness of the uterine wall. Its fiber is of the unstriped variety. Best studied at the full period of gestation.

*Three Layers :*

1. Outer, very thin, continuous with the muscular layers of the Fallopian tubes, the ovarian, round, broad and utero-sacral ligaments.
2. Middle, comprising the bulk of the uterine muscle,—a mesh-work of longitudinal and transverse bundles.
3. Inner, circular layer, surrounding the Fallopian tubes and os internum and externum.

This differentiation into layers is more theoretical than practical.

The Peritoneal Coat. The peritoneum covers about two thirds the length of the uterus in front and extends down beyond the uterus over about one inch of the vagina posteriorly. The lateral aspects of the uterus are uncovered of peritoneum over the spaces between the folds of the broad ligament.



**Ligaments of the Uterus.**

**BROAD LIGAMENTS.** The pelvic peritoneum dips down posteriorly into the lower pelvis, is reflected up over one inch or more of the upper end of the posterior vaginal wall and over the posterior surface of the uterus, passes over the uterus, investing its anterior surface to the isthmus, and is again reflected upward and over the bladder. The uterus thus lies between the layers of a transverse fold of peritoneum, its lateral surfaces between the layers being uncovered of peritoneum. The lateral portions of these transverse folds stretching from the uterus to the sides of the pelvis form the broad ligaments.

**UTERO-SACRAL LIGAMENTS.** Two semilunar folds of peritoneum, enclosing unstriped muscular fiber and connective tissue, which pass one on each side of the rectum from the lower portion of the sides of the uterus to the second bone of the sacrum. These folds are also known as the folds of Douglas, and the space between them as Douglas' pouch, or *cul de sac*.

**ROUND LIGAMENTS.** The cord-like ligaments which pass from the angles of the uterus forward through the inguinal canals, to blend with the structures at and immediately below the external ring. Length, four to five inches. They contain striped and unstriped muscular fibers.

The ovarian ligament, the Fallopian tube, and the round ligament are enveloped in subsidiary folds of the broad ligament.

*The Infundibulo-pelvic Ligament* is that part of the superior border of the broad ligament on each side, extending from the Fallopian tube to the pelvic wall.

**The Arteries** of the uterus are two uterine and two ovarian. They pass to the uterus between the folds of the broad ligament on either side. The uterine artery approaches the uterus at about the level of the os externum, the ovarian at the level of the cornua. A branch of the ovarian artery descends along the lateral border of the uterus to communicate with the uterine. Another branch supplies the fundus and anastomoses with its fellow of the opposite side. The arteries of the uterus are remarkable for their free anastomosis and tortuous course. Arterial tufts are given off to the lateral borders of the uterus whose branches form spirals within the uterine wall. They end in a mesh work of capillaries about the utricular glands. The circular artery at the isthmus unites the arteries of the opposite sides of the uterus with each other, surrounding the cervix.

**The Veins.** The uterine plexus of veins lies immediately beneath the peritoneal coat of the uterus. It communicates with large sinuses in the middle muscular coat which are encircled by muscular bundles. The venous system of the uterus empties into the ovarian plexus of veins.

**Lymphatics of the Uterus.** Very numerous and communicating with the lymph spaces of the mucous membrane and the muscular coat. They form an intricate network over the surface of the uterus under the peritoneum, also over the Fallopian tubes. They are fully developed only during pregnancy. They empty into the lumbar glands.

**Nerves of the Uterus.** Chiefly from the sympathetic, from the inferior hypogastric and spermatic plexuses. The cervix also receives filaments from the upper sacral nerves. The uterine nerves terminate apparently in the nuclei of the muscle cells.

**The Fallopian Tubes, Oviducts.** Two narrow tubes, one running outward from each horn of the uterus and communicating with the uterine cavity. The outer portion of the tube takes a tortuous course, partially surrounding the ovary.

Length, three to five inches.

**Divisions.**

THE ISTHMUS is the portion of the tube next the uterus. It is the smallest part of the tube and is about one inch in length.

THE AMPULLA is the dilated portion of the tube next beyond the isthmus.

THE FIMBRIATED EXTREMITY, PAVILION OR INFUNDIBULUM, is the free trumpet shaped end of the tube, the margin of which is fringed with a number of irregular processes called fimbriae.

THE FIMBRIA OVARICA is the special fimbria which is attached to the ovary.

The ostium uterinum barely admits a bristle.

The ostium abdominale is of the size of a small goose quill.

**Structure.**

THREE LAYERS.

*Outer or peritoneal coat* invests two-thirds the circumference of the tube.

*Middle or muscular coat*, with an inner circular and an outer longitudinal layer of unstripped muscular fiber.

*Inner or mucous coat*, lined with ciliated columnar epithelium. The mucous membrane is disposed in longitudinal folds. It has no glands. The motion of the cilia propels toward the uterus.

**The Arteries** of the Fallopian tube are branches of the ovarian.

**The Veins** open into the pampiniform or ovarian plexus lying between the folds of the broad ligament below the tube.

**The Lymphatics** unite with those from the uterus and ovary and terminate in the lumbar glands.

**The Nerves** are derived from the inferior hypogastric plexus on each side.

**The Ovaries.** Two in number, one on each side of the uterus, corresponding to the testes of the male.

**Situation.** One on the posterior fold of each broad ligament about one inch or more below the level of the ilio-pectineal line and the same distance from the uterus, yet they have great mobility within normal limits. Each ovary is attached by its anterior edge to the anterior fold of the broad ligament, projects through the posterior fold, and is connected with the corresponding horn of the uterus by the ovarian ligament.

**Size.** About one and a half inches in length by three-fourths in width and one-half in thickness, yet variable. Average weight about eighty grains. Size increases during menstruation, also in early pregnancy. Larger in young virgins than at any other period of life except the first six weeks of pregnancy.

**Shape.** A flattened ovoid or that of a flattened pigeon's egg. Its free border is convex. The anterior edge by which it is attached to the broad ligament is nearly straight. This straight border is the hilum. It is thinner at the hilum, thicker at the convex border. Its superior surface is nearly flat, the inferior convex. The inner end is narrower and pointed and merges into the ovarian ligament, the outer is more obtuse and bulbous.

**The Ovarian Ligament** is a mere cord containing some muscular fiber, and extending from the inner end of the ovary to the horn of the uterus, joining it immediately behind and below the attachment of the Fallopian tube. Is about one inch in length.

**The Arterial Supply** is derived from branches of the ovarian arteries, which enter at the hilum.

**The Veins** emerge from the hilum and empty into the bulb of the ovary, which communicates with the pampiniform plexus.

**The Lymphatics** together with those of the tube and uterus, empty into the lumbar glands.

**The Nerves** are derived from the inferior hypogastric plexus.

### Structure.

#### External Structure.

In early life the external surface is smooth, like an almond.

Later in life, after puberty, it becomes uneven, acquiring a wrinkled appearance, owing to the cicatrices from rupture of Graafian follicles.

In very old age it again becomes smooth.

Its epithelium is that of a mucous membrane, columnar and non-ciliated, the germ epithelium of Waldeyer. The peritoneum terminates abruptly at the ovary.

#### Internal Structure.

Consists of connective tissue, some unstriped muscular fiber, Graafian follicles, blood vessels, nerves, lymphatics.

*The Medullary Zone*, or *Zona Vasculosa*, is the portion about the hilum, reddish in color. Here enter the blood vessels, nerves and lymphatics.

*The Zona Parenchymatosa*, or cortical portion of the ovary, grayish in color.

*The Tunica Albuginea* is a dense layer of ovarian stroma immediately underlying the germinal epithelium.

*The Graafian Follicles*, or Ovisacs.

**The Graafian Follicles** are most numerous in the cortical layer. They are developed from the germ epithelium of the ovarian surface.

Number at birth, 40000, or more in each ovary.

Each follicle contains, generally, but one ovum.

At any time during the child-bearing period, ten or twenty Graafian follicles may be found considerably developed near the surface of the ovary.

Size, 1-100th to 1-16th inch in diameter.

**STRUCTURE.**

1. Tunica Fibrosa.
2. Tunica Propria.
3. Tunica (Membrana) Granulosa, a multiple layer of cylindrical epithelium.
4. Liquor Folliculi, a clear albuminous fluid, para-albumen.

The Discus Proligerus, or Germinal Eminence, is a heaped up mass of cells of the membrana granulosa at one side, containing the ovum.

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## PREGNANCY.

**Ovulation.** The process by which the ovum is matured and discharged from the ovary. It occurs, in the rule, once in twenty-eight days, during the period of functional activity of the ovary. Is attended generally in the human subject with a bloody discharge from the uterus,—menstruation. Yet ovulation may occur without menstruation, and menstruation without ovulation. Hence an ovule may exceptionally be discharged at any period between the menstrual epochs. Generally the discharge of the ovule takes place during menstruation. Usually but a single follicle ruptures at each epoch, sometimes two or more.

**Menstruation.** A partial exfoliation and renewal of the endometrium usually attending ovulation. It is accompanied with certain local and general nervous and vascular disturbances and, in the human female, with a bloody discharge from the uterus.

A new growth of endometrium is complete in nine or ten days from the beginning of each menstrual epoch. Menstruation, therefore, is apparently designed to fit the uterus for the reception of a fertilized ovum.

**CHARACTER OF THE MENSTRUAL OR CATAMENIAL FLOW.** Constituents, blood, shreds of endometrium, uterine and vaginal secretions.

Reaction alkaline. Does not clot in health.  
Amount five to ten ounces.

Duration, three to seven days.

The interval between the menstrual epochs is usually twenty-eight days.

**PUBERTY** is synonymous with sexual maturity and is marked in the female by the first onset of ovulation and menstruation. The anatomical and mental characteristics of the sex are gradually developed at this period of life.

**AGE OF PUBERTY.** The usual age of puberty is the fifteenth year. It varies with race, climate and other influences, occurring in exceptional cases as early as the tenth or as late as the twentieth year of age.

**THE MENOPAUSE,** or the final cessation of menstruation and of the capacity for child-bearing, occurs in most women at about the age of forty-six years. Occasional variations of ten years or more on either side of this limit are possible.

#### **Phenomena Attending the Rupture of a Graafian Follicle.**

Increase of fluid contents from increased vascularity. Loops of blood vessels are projected into the cavity of the follicle. Contiguous portions of the ovary and, to a certain extent, its whole structure, ex-

hibit a similar increase in vascularity. The follicle now appears as a bright red spot on the surface of the ovary.

Absorption of overlying ovarian structure takes place owing to increasing pressure of the liquor folliculi.

The follicle finally ruptures and discharges its contents, an effusion of blood taking place into the follicle after rupture. The ovum is floated into the pavilion of the tube by a stream of serum propelled by the cilia of the fimbria ovarica. It is propelled through the Fallopian tube partly by ciliary motion, and in the narrower portion of the tube partly by muscular action.

#### **The Ovum.**

Size. 1-120th inch in diameter at full maturity.

Structure. A nucleated cell developed from the germ epithelium covering the surface of the ovary.

#### **Parts.**

1. Vitelline Membrane.
2. Zona Pellucida.
3. Vitellus, or Yolk. A mass of oleo-albuminous matter containing shining granules. The vitellus tends to divide into segments. The tendency to segmentation is increased by fecundation.
4. Germinal Vesicle. 1-700th inch in diameter, situated toward one side of the yolk near its surface, the nucleus of the cell.
5. Germinal Spot. A dark, granular spot, about 1-3000th inch in diameter, within the vesicle, the nucleolus of the cell.

Female Pronucleus. The germinal vesicle becomes the female pronucleus.

**The Corpus Luteum.** The body formed in the ovary during the retrograde metamorphosis of the Graafian follicle after rupture.

THE CORPUS LUTEUM OF MENSTRUATION. Attains its full development in two to four weeks, and becomes reduced to a mere cicatrix by the end of about two months.



**THE CORPUS LUTEUM OF PREGNANCY.** Growth continues for six or seven weeks ; then

Stationary to the end of the fourth month ;

Subsequently retrogrades slowly until delivery.

An insignificant cicatrix at the end of a month after delivery.

**Impregnation** is the fructification of the ovum by union with the fecundating elements of the male.

**The Seminal Fluid**, which contains the fructifying elements of the male, the spermatozooids, is a glutinous alkaline non-albuminous fluid, heavier than water, essentially the product of the testicles.

Filtration deprives it of its fecundating power.

About three drachms is ejaculated during the orgasm.

**The Spermatozooids** are microscopic bodies resembling tadpoles in shape. Each consists of a flattened ovoid head (cell nucleus) and a long thread-like tail.

Length, 1-600th to 1-400th inch. The filiform tails maintain a constant lashing motion due to amœboid movements of protoplasm as long as the spermatozooids retain their fecundating power.

**Vitality of Spermatozooids.** Under favorable conditions, within the genital passages of the female, the spermatozooids as well as the ovum retain their vitality for an unknown period of time. They have been known to live in the human species under favorable circumstances for eight days. They undoubtedly retain their fecundating power for a much longer time. Have been found after copulation in every portion of the genital tract, even on the surface of the ovary. Are destructible by extreme heat or cold.

The seminal elements of man retain their power of motion, however, between the temperatures of  $-15^{\circ}$  and  $+47^{\circ}$  C. They are destroyed by acids, by numerous other chemical poisons and by desiccation.

**The Migration of Spermatozooids.** Normally the male fluid is ejaculated upon and about the cervix. Yet the spermatozooids may traverse the entire length of the genital tract and impregnation is possible without introception of the male organ. Locomotion is accomplished by the vibratile motion of the tail. Rate of locomotion one inch in seven and a half minutes (Henle)

**Impregnation Occurs :**

Where? Impregnation takes place in the Fallopian tube or possibly in the uterus.

When? It occurs in the great majority of cases within a week after the cessation of a menstrual period.

How? A spermatozoid penetrates the zona pellucida of the ovum, mingles with the egg protoplasm and forms the male pronucleus. A single ovum is fecundated by a single spermatozoid. The male and female pronuclei unite to form the vitelline nucleus of the fecundated egg.

**Development of the Ovum.** The egg on leaving the ovary consists of the parts above described and has a diameter of 1-120th inch. Cells of the membrana granulosa partially envelope it on its escape from the ovary. It receives an albuminous envelope in the course of its passage through the oviduct. This envelope supplies the first nutriment for the development of the egg.

Segmentation of the vitellus, or yolk, takes place until the whole yolk becomes a granulated mass.

**THE BLASTODERM.** Each granule becomes a separate cell. The cells unite to form a continuous membrane which lines the zona pellucida. This is the blastodermic membrane from which all the embryonic structures are subsequently formed. Cleavage takes place through the vitelline nucleus, its ultimate segments forming the nuclei of the cells of the blastoderm.

Segmentation in the human subject probably does not occupy more than eight or ten days. The ovum now has a diameter of 1-100th to 1-80th inch.

The blastoderm forms in two layers, the external and internal layers (epiblast, hypoblast). A third layer, the mesoblast, is subsequently developed.

From the external blastodermic layer are formed the epidermis, the cerebro-spinal axis, etc.

From the middle layer are developed bone, muscle, connective tissue, the heart and blood vessels and the genito-urinary organs.

From the internal blastodermic layer, the epithelium of the alimentary and respiratory tracts, etc.

**THE BLASTODERMIC VESICLE.** By the accumulation of fluid in the ovum it becomes converted into a vesicle called the blastodermic vesicle.

**THE AREA GERMINATIVA OR EMBRYONIC SPOT.** The blastoderm soon presents an opaque, oval spot upon its surface, consisting of an aggregation of cleavage cells on the inner surface of the membrane. This is the *area germinativa*.

**THE AREA PELLUCIDA** is a clear oval space, which appears a little later in the area germinativa, with an opaque border.

**THE PRIMITIVE TRACE** is a shallow groove or sulcus which now develops lengthwise through the center of the area pellucida.

This is the first indication of embryonic structure and marks the place of the cerebro-spinal canal.

*The Dorsal Laminæ* are two longitudinal folds which spring up on either side of the primitive trace.

They ultimately unite to form the cerebro-spinal canal.

*The Ventral Laminæ* subsequently develop and unite in similar manner.

**THE UMBILICAL VESICLE.** At this stage of development the inner layer of the blastodermic vesicle becomes divided into two parts, the embryonic portion and the umbilical vesicle. The embryonic portion constantly increases in size, the umbilical vesicle diminishes till at the end of the sixth week it is no larger than a pea, and the last vestige of it has disappeared by the end of the fourth month.

**Development of the Embryo and Fœtus.****First Month :**

Ovum the size of a pigeon's egg. Length of embryo one-third of an inch.

First rudiments of fœtal structure discernible.

Heart, kidneys, liver, extremities and the eyes, oral and anal orifices begin to be formed.

Spinal canal closed.

**Second Month :**

Ovum the size of a hen's egg.

Length of fœtus one and a quarter inches.

Rudimentary vertebræ.

Frontal unites with the superior maxillary processes.

Centers of ossification in inferior maxillary bones and clavicle.

Eyes, nose and ears begin to be developed.

Rudiments of hands and feet appear, webbed.

Visceral arches nearly closed.

Sexual organs apparent.

**Third Month :**

Ovum size of a goose's egg.

Fœtus about three inches in length.

Product of conception now, for the first time, occupies the whole cavity of the uterus.

Placenta distinctly formed, chorionic villi atrophied over two-thirds the surface of the ovum.

Umbilical cord begins to be twisted.

External parts of the embryo well formed.

Ossific centers appear in nearly all the bones.

The cavities completely closed.

Sex differentiated by the presence or absence of a uterus.

Active movements begin during the latter part of this month.

**Fourth Month :**

Length of fœtus six inches.

Average weight about three ounces.

Ossification well established in frontal and occipital bones.

Sex clearly defined.

Lanugo present.

Placenta complete.

Fifth Month :

Length of fœtus ten inches.

Average weight about nine and a half ounces.

Eyelids begin to open.

Ossification begins in the ischium.

Hair and nails begin to develop.

First appearance of vernix caseosa.

Sixth Month :

Length of fœtus twelve inches.

Weight about twenty-three ounces.

Ossification begins in the pubic bones.

Seventh Month :

Length of fœtus fourteen inches.

Average weight two and a half pounds.

Pupillary membrane begins to disappear.

In boys, testes in the scrotum, at least the left one.

Ossification begins in the astragalus.

Eighth Month :

Length of fœtus sixteen inches.

Average weight three and a half pounds.

Nails completely developed, but not projecting beyond finger tips.

Ossification begins in lower epiphysis of the femur.

Ninth Month :

Length of fœtus seventeen to eighteen inches.

Diameters of the head a half to two-thirds of an inch less than at term.

Average weight about five and a half pounds.

Tenth Month :

At term average length of fœtus is from eighteen to twenty inches.

Average weight, boys seven and a third pounds ; girls seven pounds.

Signs of Maturity :

Measurements.

Weight.

Eyes usually open.

Plumpness.

Suckling.

Lanugo has disappeared from the face.

Vernix caseosa present only on the back and on the flexor surfaces of the limbs.

Finger nails project beyond the finger tips ; toe nails to end of the bed of the nail.

Cartilages of the ear and the nose firm.

Cranial bones hard, sutures and fontanelles small.

Centers of ossification well developed in the lower epiphysis of the femur and the astragalus, beginning in the upper epiphysis of the tibia and the cuboid bone.

#### **Development of Membranes and Placenta.**

**Membranes.** Two Maternal and two Fœtal. They become ultimately fused into one which, with the placenta, lines the cavity of the uterus and contains the fluid, (liquor amnii,) in which the fœtus floats.

#### **Maternal Membranes.**

A. DECIDUA VERA is developed from the mucosa of the uterus, and is the outermost of the envelopes of the fœtus. It increases in thickness ten fold in the first month, *i. e.*, to two-fifths of an inch.

This and the decidua circumflexa, about to be described, are called deciduae because they are thrown off with the ovum. The decidua vera ends at the os internum. It has the shape of the cavity of the uterus and has three apertures, one corresponding to the internal os and one to the opening of each Fallopian tube. When thrown off it retains the shape of the cavity. Except at the placenta the deciduae undergo atrophy and are reduced to a single thin membrane by the end of the third month.

B. DECIDUA CIRCUMFLEXA OR REFLEXA or epichorial decidua.

When the ovum becomes embedded in the folds of the uterine mucosa, that membrane grows up around it. This reflected envelope is the decidua circumflexa or reflexa. It grows with the ovum and comes in contact with the decidua vera at about the end of the third month, blending with it. The entire cavity of the uterus is from this time occupied with the ovum and its membranes.

**DECIDUA SEROTINA OR PLACENTAL DECIDUA.** A name given to that part of the decidua vera that underlies the ovum, where the placenta is subsequently developed.

### Fœtal Membranes.

#### A. AMNION, the innermost of the fœtal envelopes.

**Development.** As soon as the embryo begins to take shape, a second fold of the external blastodermic ridge springs up entirely around the edges of the embryo.

This membranous ridge develops till its edges meet over the back of the embryo. The surfaces brought in contact fuse together. The neck of the pouch thus formed is subsequently absorbed. The pouch itself is the amnion. It has neither vessels nor lymphatics.

The outer blastodermic layer recedes toward the zona pellucida to become part of the chorion.

**THE LIQUOR AMNII** is the clear fluid which accumulates in the cavity of the amnion.

**Source.** Chiefly the maternal blood vessels.

**Composition.** Water, a trace of albumen, saline matter, urea.

**Amount.** Between one and two pints at term.

**Specific Gravity,** 1007.

**Uses :**

During gestation :

Protection of fœtus and uterus.

Permits active fœtal movements.

During parturition :

Protects foetus and uterus.

Helps dilate the cervix.

Facilitates obstetric operations.

Helps lubricate the passages.

THE ALLANTOIS. Before the formation of the amnion is complete a diverticulum has pushed out from the posterior portion of the entoderm or intestinal canal; this is the allantois.

The allantois is projected to the external envelope of the ovum, between the amnion and the outer blastodermic fold, and it expands till it completely envelopes the embryo and its investing amnion, and lines the external envelope of the ovum as a flattened sac.

It forms about the tenth day and runs its course in a few days more.

Its office is to project vessels from the embryo to that portion of the outer envelope where the placenta is to be developed, the chorion frondosum.

The pedicle of the allantois dwindles to a mere cord known as the umbilical communication.

The amnion in the course of its development invests the umbilical communication forming the sheath of the umbilical cord.

The umbilical communication carries two arteries and two veins, the rudimentary umbilical vessels which communicate with the chorionic villi.

One vein becomes obliterated about the fifth or sixth week.

B. CHORION. The outermost of the envelopes of foetal origin.

Formation. A portion of the allantois fuses with the layers external to it, the external blastodermic layer and the remains of the



zona pellucida. The membrane thus formed is the chorion. Between the chorion and the amnion is a layer of gelatinous material in which the umbilical vesicle lies enveloped.

The amniotic sac expands till it comes in contact with the chorion and unites with it at the end of the fourth month. The intervening gelatinous material thus encroached upon is absorbed except within the amniotic sheath of the umbilical cord.

The envelope of the ovum is now, after four months, practically a single membrane, the product of the union of the maternal and foetal membranes. They are generally adherent, though usually the amnion may be stripped off from the chorion after the expulsion of the placenta.

**VILLI.** Soon after the fixation of the egg, its surface becomes everywhere covered with transparent villi. They are at first single, but with the growth of the ovum they elongate and become compound. The outer surface of the globular ovum thus becomes everywhere "shaggy."

They resemble no other structure found in the uterine cavity. Their presence in the uterus is, therefore, positive evidence that pregnancy has recently existed.

**BLOOD VESSELS.** The villi at first are not vascular, but they soon receive vessels from the allantois.

The capillaries of the chorial villi enter the stem of the villus, follow the subdivisions, go to the end of each rootlet, turn, forming a loop, and go back to empty into the venous trunks of the chorion. The chorial villi are thus very similar to those of the intestines in structure and in function.

**CHORION LAEVE.** Toward the end of the second month the chorion begins to become bald everywhere except over the portion about the insertion of the foetal blood-vessels.

Over two-thirds the surface of the chorion the villousities continue to atrophy until by the end of the second month this part of the chorion becomes smooth, the *chorion laeve*.

**CHORION FRONDOSUM.** Over the remaining third of the surface of the chorion the villousities develop more rapidly than before till this portion presents a thick, spongy mass of villousities, the *chorion frondosum*.

They enter into the formation of the placenta. The development of the vessels keeps pace with the growth of the villousities in the placental portion of the chorion; elsewhere the capillaries shrink with their villi.

After the formation of the placenta the non-placental portion of the chorion serves only for protection.

**The Placenta.** When fully formed it is a spongy mass of lenticular shape. Diameter seven to nine inches, and about one inch thick at the insertion of the cord. Weight sixteen ounces or more after it is detached from the uterine wall.

#### TWO SURFACES.

*Fœtal.* A smooth surface of amniotic membrane.

Umbilical cord attached generally at the center.

*Maternal.* Rough, divided into irregular lobes or cotyledons from one-half to one and a half inches in diameter, sixteen to twenty in number. These lobes are separated by membranous partitions which penetrate the substance of the placenta at their borders, as far as the foetal surface. The maternal surface is covered with the outer

portion of the decidua serotina. After separation of the placenta, it is studded with small openings, mouths of vessels torn across, oblique openings of the veins and the mouths of the curling arteries of Hunter.

**STRUCTURE.** Consists essentially of blood vessels. The vascular fœtal tufts, sixteen to twenty in number, are suspended in lakes of maternal blood. The lakes are supplied by the curling arteries of the uterus. The maternal blood returns from the spaces between the fœtal tufts by the coronary vein upon the margin of the placenta and by sinuses situated in the septa between the cotyledons. The fœtal and maternal circulations do not communicate directly. The fœtal tufts are made up of loops of blood vessels which are bathed in maternal blood, from which nutriment and oxygen for the fœtus are derived by osmose. Effete matter thrown off from the fœtal circulation is returned in like manner to the maternal blood.

**SEAT.** Usually the anterior or posterior wall of the uterus with about equal frequency; rarely the insertion is lateral.

**FUNCTION.** At once the nutritive, respiratory and excretory organ of the fœtus.

**DEVELOPMENT.** Begins in the second, ends with the fourth month of gestation. The placenta attains its characteristic form and structure at about the end of the fourth month, though its limits are distinctly defined at the end of the third.

The chorionic villi penetrate the inter-glandular portions of the mucosa, not the uterine follicles.

The walls of the crypts into which the villi dip are lined with epithelium and are very vascular.

The tufts continue to increase in the number and extent of their ramifications and in vascularity.

The development of the decidua keeps pace with that of the chorionic villi. The uterine crypts enlarge and ramify to correspond. The capillaries of the decidua multiply, enlarge and inosculate till every loop

of the foetal villi is enveloped by a mesh-work of dilated maternal capillaries. Both systems of vessels grow and multiply with the development of the placenta. As the development progresses, the anatomical character of the foetal blood vessels remains unchanged. The maternal capillaries about the uterine crypts enlarge and obliterate the interspaces, and they thus coalesce into great lakes of blood. These lakes communicate freely with the uterine sinuses.

The placenta then is made up of four elements: Maternal,—uterine crypts, blood vessels around the crypts ; Foetal,—chorionic tufts, vessels of the tufts.

The foetal is separated from the maternal blood only by the walls of the foetal tufts. These walls are formed by fusion of four walls, viz.: that of the uterine crypt, the uterine vessels, the chorionic villi and the foetal vessels.

The foetal villi are clothed with a layer of epithelium. These cells possibly have some other function than mere osmosis,—a secretory action.

**Umbilical Cord**—The pedicle which connects the foetus with the chorion frondosum, or placenta (alluded to above as the umbilical communication). At the end of about the first month it becomes invested with a process of amnion which includes a portion of the vitriform body. In the cord this material is the gelatine of Wharton. It serves to protect the vessels of the cord.

Insertion of the cord generally central, sometimes lateral, marginal or velamentous. By the latter is meant one in which the vessels separate in the membranes before reaching the placenta.

Length, generally about twenty inches may be from seven or less to sixty inches.

Size, about that of the little finger of the adult.

Capable of sustaining a weight of ten to twelve pounds.

Embedded in it are two arteries and two veins at first ; subsequently the veins fuse into one. Exceptionally there is but one artery. The walls of its arteries are only a little thicker than the walls of the veins. The cord is usually twisted, the vein being wound around the arteries.

The existence of nerves and lymphatics in the cord has not been proven.

#### Time of Closure of the Fœtal Apertures.

Umbilical arteries two days after birth.

Umbilical vein and ductus venosus generally six to seven days.

Ductus arteriosus within nine to fifteen days.

### Effects of Pregnancy on the Maternal Organism.

#### Changes in the Uterus as a whole.

The first effects of pregnancy are noted in the uterus. It changes in size, shape, situation and structure.

Size. Non gravid nulliparous uterus is about three inches in length.

At term the uterus measures at least twelve inches in length.

Growth begins immediately with the fixation of the ovum, and is continuous with the development of the fœtus. Its growth during the first two months is chiefly in the lateral and antero-posterior directions. The uterine enlargement is partially a dilatation in the latter months.

The thickness of the uterine walls at term is between one-sixth and one-quarter inch.

Farre and Tanner's Table.

LENGTH:				WIDTH:	
3 Months,	4 1-2 —	5 Inches.		4	Inches.
4       “	5 1-2 —	6       “		5	“
5       “	6       —	7       “		5 1-2	“
6       “	8       —	9       “		6 1-2	“
7       “	10	“		7 1-2	“
8	11	“		8	“
9	12 1-2	“		9 1-2	“

The surface is increased from 5 or 6 to 350 square inches.

The capacity from 1 to 400 cu. in.,—519 times.

The weight from one or one and a half ounces for the præ-gravid state to two or two and a half pounds at term.

Shape. First three months, pyriform. Second and third months the corpus uteri is a flattened spheroid. The last three months it is generally ovoid with the smaller end down.

In the early months the normal anteflexion is increased.

Situation. During the second month the uterus generally sinks lower in the pelvis. At the end of the third month or soon after, the fundus is above the brim. At the end of the fourth month the fundus is two or three inches above the symphysis pubis. Sixth month near the umbilicus. Ninth month approximates the ensiform cartilage. Within about ten days of labor it sinks and falls forward. During the latter months the uterus rests on the symphysis pubis and abdominal wall, and has a right lateral obliquity and right torsion.

Structure. The changes in its muscular tissue consist in hypertrophy of its muscular fiber and extensive development of new unstriped muscular tissue.

The muscular fiber grows seven to ten times in length. At the os internum there is a preponderance of circular fibers in all the layers. The uterine plexus of veins becomes developed into a system of enormous sinuses in the middle coat of the muscularis and in the inner coat beneath the placental attachment.

The lymph tubes become hypertrophied to the size of a goose quill.

Hypertrophy of the nervous tissues probably keeps pace with the development of other uterine structures.

**Changes in the Cervix.**

**Size.** The cervix is as long as it ever is at the eighth month, and generally at the beginning of labor. It is then gradually obliterated by dilatation from above. The apparent shortening of the cervix during gestation is due partly to softening, and in part to swelling of the vaginal mucous membrane and loose cellular tissue around the cervix at the vaginal junction. The cervical enlargement is due in part to hypertrophy, but mainly to loosening of its structure from serous infiltration, and is complete at about the eighth month.

**Structure.** Softening is progressive from below upward and involves the entire cervix by the end of the eighth month.

**Shape.** It dilates during gestation from below upward. At the end of the eighth month the head of the child may generally be touched with the finger through the cervix.

**Changes in other Pelvic Structures.** The peritoneal covering of the uterus is developed by tissue growth—*pari passu* with the development of the uterus.

The broad ligaments accommodate themselves to the growth of the uterus partly by the unfolding of their layers and partly by hypertrophy of structure.

The ovaries and Fallopian tubes lie in contact with the uterus.

The vagina becomes hypertrophied during pregnancy. It increases in the size and length of its walls and in vascularity.

**Hypertrophy of the Heart.** Hypertrophy of the left ventricle of the heart during gestation is physiological and is designed to meet the increased resistance in the systemic circulation introduced by the new vascular arrangements of the uterus and placenta. It remains during gestation.

**The Thyroid Gland** becomes hypertrophied during preg-

nancy, and a certain degree of enlargement remains permanent.

**The Spleen** is also enlarged.

**Changes in the Blood State.**

The total volume is increased during the latter half of pregnancy.

The proportion of water is little, if at all, increased.

There are more white corpuscles.

More fibrin.

More effete matter (from circulation of the fœtus).

Fewer red corpuscles.

Less albumen.

Less hæmaglobin.

There is usually a marked gain in the weight of the body during the latter months.



## SIGNS OF PREGNANCY.

**History : Anamnesis.****Suppression of Menses.**

From date of conception.

The earliest sign.

In the absence of other apparent cause it affords strong presumptive evidence of pregnancy.

Other possible causes of suppression are

Chlorosis;

Phthisis;

Chronic nephritis;

Cold;

Change of climate;

Emotional causes;

Tardy menstruation;

Menopause.

Not available for diagnosis in

Lactation;

Patients who have not yet menstruated;

Periodical hemorrhage during the first three months from the portio vaginalis, polypus of the cervix, the cervical endometrium, chronic decidual endometritis, placenta prævia.

**Digestive Disturbances.****Dyspepsia.**

Early months.

Nausea. Generally from 1st to end of 3rd month.\*

A morning sickness.

A reflex from the uterus during its development in the lesser pelvis.

Present for a longer or shorter time in the great majority of cases.

Exclude pathological causes.

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\* In this table of signs end of month is meant unless otherwise indicated. The time given is that from which the sign is available except when otherwise specified.

**Ptyalism.** A reflex excitation of the salivary glands sometimes accompanied with excessive secretion of mucus in the mouth and throat.

Marked salivation is exceptional.

**Certain mammary signs.** Enlargement, sense of prickling, tenderness, weight and fulness.

**Certain abdominal signs.** Enlargement, pigmentation, quickening.

## Physical Signs.

### I. Mammary.

Rarely all present.

Of great value collectively in the primipara; of little use in women who have borne children since many of the mammary changes remain in a measure permanent.

**Size and Firmness.** 2nd month or earlier.

Increase in size of the gland.

The increase is due to development of the acini, swelling of the connective tissue, interlobular deposit of fat.

Most significant when progressive.

Distinguish from overlying fat by palpation.

Identify the gland by its nodular border.

Distinguish from enlargement due to pathological causes.

**Erectility of Nipple.** 2nd month.

Becomes turgid and protuberant when lightly stroked with the finger.

**Primary Areola.** 2nd month.

Becomes pigmented, elevated, œdematous.

*Pigmentation* varies with the complexion of the patient. Is faintly developed in blondes, marked in brunettes and nearly black in the negress.

Shades into the color of the skin at the upper and outer aspect of the areola at the end of second month.

May arise from pathological conditions of the pelvic organs.

Of little value after the first pregnancy.

**Glandular Follicles.** 2nd month.

These are hypertrophied sebaceous follicles.

Ten to twenty in number.

Situated in the primary areola.

**Veins.** 2nd month.

Everywhere more prominent over the breast.

Coursing in across the primary areola.

Sometimes due to pathological reflexes from the pelvic organs.

**Milk in the Breasts.** 3rd month.

A milky serum may be pressed from the nipples.

Strong presumptive evidence in primiparæ.

Yet milk secretion is possible in the virgin or even in males.

**Secondary Areola.** 5th month.

A faintly pigmented areola around the primary areola.

Characterized by round, faintly marked, washed-out spots immediately about the primary areola, especially at its upper and outer aspect.

Due chiefly to enlarged and non-pigmented sebaceous follicles.

Diagnostic when well made out.

**II. Abdominal.**

**1. Inspection.**

**Abdomen Flattened.** In 2nd month.

Uterus sinks lower in the pelvis.

**Abdomen Enlarged.** 3rd month.

Uterus rises out of the lesser pelvis.

**Abdomen Pigmented.** 2nd month.

A pigmented line one-eighth inch wide from the pubes to the umbilicus or even to the ensiform cartilage. Not diagnostic.

**Umbilicus.**

Retracted. In first trimestrium.

Protruded. In 8th and 9th months.

**Lineæ Albicantes.** 6th month.

Due chiefly to partial atrophy from tension.

**2. Palpation.****Size of the Tumor.**

Fundus at the pelvic brim.	3rd month.
Near the umbilicus.	6th month.
At the ensiform cartilage.	8½ months.
Measurements (see Farre and Tanner's table,	

page 31).

**Character of the Tumor.**

Smooth, symmetrical, pyriform, fluid.

Detection of foetal parts in the last trimestrium and earlier.

**Intermittent Contractions.** 4th month.

Recur at intervals of five or ten minutes. Obtainable immediately by gentle friction.

Not interrupted by death of the foetus.

Exclude hæmatometra, soft fibroids and distended bladder.

**Active Foetal Movements. Quickening.**

*As an objective sign,*

By abdominal palpation. 4th month.

By the bimanual. 12th week.

Most promptly obtained by applying hand cold to the abdomen, or by first tossing the foetus from side to side.

Muscular movements begin 10th week.

May fail in hydramnios, etc.

Diagnostic when well made out.

*As a subjective sign,* 4th month.  
(12th week to 4½ months.)

Not wholly reliable as a subjective sign.

May be simulated by intestinal flatus, spasmodic contractions of the abdominal muscles or other causes.

**Passive Movements of the Foetus. External Ballottement.**

Consists in tossing the foetus or the foetal head by abdominal palpation.

**3. Auscultation.****Foetal Souffle.**

4th month.  
Synchronous with the foetal pulse.

Origin.

Umbilical from impeded flow of blood in the cord, probably due to pressure;

Cardiac from valvular lesions or certain other mechanical or from functional causes.

**Uterine Souffle.** 4th month or earlier.

Synchronous with the maternal pulse.

Due to the current of blood in the uterine arteries and their branches.

Best heard usually over the lateral borders of the uterus, especially the left.

Uterine fibroids, chronic metritis, or even ovarian cysts may give rise to a similar souffle.

A valuable sign in the absence of these conditions.

**Choc Fœtal.** 3rd month.

The shock of the fœtal movements as perceived by the ear.

The *bruit de choc fœtal* is a bruit that immediately precedes the choc fœtal.

**Fœtal Heart-Sounds.** 4½ to 5 months.

12th week by vaginal stethoscopy.

Rate, about double the maternal pulse, 120 to 150.

Generally loudest directly over the fœtal heart.

Audible over an area of about three inches in diameter.

May be absent from death of the fœtus.

May be temporarily inaudible from dorso-posterior positions, hydramnion or other causes.

Method:

A still room.

Dorsal decubitus with the thighs partially flexed.

Listen over the fœtal dorsum.

Press the abdominal and uterine walls in contact.

Failing, repeat the examination at intervals of several hours or days.

A rhythmical succession of sounds of characteristic quality and rhythm, of double the maternal pulse-rate, and which can be counted, alone makes the diagnosis of pregnancy.

### III. Pelvic.

**Dusky Hue of the Vagina.** 2nd month.

Most constantly found on the anterior wall immediately below the meatus urethræ.

Due to hypertrophy of the corpus cavernosum of the vestibule and of the vaginal venous plexuses.

Present in about five-sixths of all cases at the end of the 3rd month.

Valuable when well defined.

Exclude pathological causes.

**Softening of the Cervix.** 6th week.

Is progressive from the lower border of the cervix upward.

Involves the whole cervix by the end of the 8th month.

Not always well defined in the early months.

May arise from pathological causes.

Canal of the cervix becomes progressively more patulous.

**Passive Fœtal Movements. Internal Ballottement.**

Available during the 5th and 6th months or longer according to the size and mobility of the fœtus.

Method:

Semi-recumbent or standing posture.

Intravaginal finger against the anterior uterine wall above the cervix.

Fœtus tossed upward falls again and reperscusses the finger.

Distinguish from

Stone in the bladder;

Anteflexed uterus ;  
 Pedunculated tumor of the ovary ;  
 Internal projections of large cysts ;  
 Floating kidney.

May fail with

Scanty liquor amnii;  
 Abdominal presentation;  
 Placenta prævia;  
 Multiple fœtus or  
 Other causes.

### The Bimanual.

6th week.

Among the most reliable signs obtainable in the second and third months are the changes in shape, size and consistency of the uterus due to the development of the globular ovum in its cavity, viz.:

Bellying of the lower uterine segment, especially in front;

Elasticity of the corpus uteri;

Fluctuation of the corpus uteri.

Distinguish from areolar hyperplasia by greater density in the latter.

Distinguish from sub-involution in which the enlargement is mainly in length.

Distinguish from an anteflexed and hyperæmic uterus.

### Hegar's Sign.

6th week.

Softening, compressibility and resiliency of the lower uterine segment, especially marked in the median line.

Method: Uterus depressed by the external hand, or drawn down by a volsella.

Thumb of the other hand in the vagina against the lower uterine segment at junction with cervix.

Finger in the rectum above the utero-sacral cul de sac.

Tissues between the thumb and finger may be compressed almost to the thinness of a visiting card.

Examination may be facilitated by the use of an anæsthetic, and by distending the lower end of the rectum with water.

**Pulsation of the Uterine Artery.**

Eliminate pathological causes.

**Temperature of the Cervix.**

$\frac{1}{2}^{\circ}$  to  $\frac{3}{4}^{\circ}$  F. above that of the vagina.

**Summary of Diagnostic Signs.**

Mammary Signs Collectively, in the Primipara;  
 Intermittent Uterine Contractions;  
 Detection of Fœtal Parts;  
 Active Fœtal Movements;  
 The Bimanual;  
 Hegar's Sign;  
 Ballottement;  
 Fœtal Heart.

**Differential Diagnosis.**

In general, pathological tumors are distinguished by absence of the signs of pregnancy, especially the changes in the uterus peculiar to pregnancy.

**Fat in the Abdominal Walls** can be lifted in folds and moved over the abdominal muscles.

**Phantom Tumor** disappears under anæsthesia.

**Tympanites.**

Generally subsides in the morning.

Percussion, note tympanitic.

Palpation negative.

Abdominal walls can be gently pressed backward against the vertebral column.

**Ascites.**

Abdomen flattened at the umbilicus,—in the dorsal position.

Generally, tympanitic percussion at the summit of the tumor from flotation of intestines.



Fluid wave through all parts of the tumor within the limits of the fluid. In pregnancy the wave is interrupted by the foetal ovoid.

Changes of fluid level in different postures.

**Enlarged Liver or Spleen.**

Tumor traceable from the normal situation of those viscera. Uterus independently movable.

**Ovarian Cystoma.**

History of asymmetrical enlargement of the abdomen, usually.

Palpation reveals, usually a globular cyst, but no foetal parts.

Marked fluctuation, generally.

**Myomata of the Uterus.**

Submucous.

History of hemorrhage.

Density of the tumor.

Sub peritoneal.

Surface of the tumor nodulated.

Pregnancy and myomata or other pelvic neoplasms may coexist.

PLURAL PREGNANCY.

**Plural Pregnancy.**

Frequency of twins, 1-80 to 1-90.

Frequency of triplets, 1-6000 to 1-8000.

Quadruple and even quintuple pregnancies are possible.

Viability less in multiple than in single foetation.

Twins are generally undersized and of unequal development.

**Origin of Multiple Pregnancy.**

Simultaneous rupture of two or more Graafian follicles in the same or in different ovaries.

Two ovules in one follicle.

Single ovule with a double germ.

**Arrangement of Membranes and Placenta.**

In twin foetation from two ovules:

Two amnions, two chorions, two placentas.  
Placentas may fuse at their margins, each

having an independent circulation.

In twin foetation from a single ovule with a double germ:

One chorion containing two amnions; one placenta.

Rarely two foetuses in a common sac by destruction of the amniotic septum.

Children from the same ovule are always of the same sex.

**Diagnosis of Twins.**

Size of the tumor;

Shape of the tumor;

Greater width;

Longitudinal sulcus,—not diagnostic;

Supra-pubic œdema;—occurs also in simple hydramnios.

Multitude of small parts;

Two dorsal planes;

Three or four foetal poles;

One head in the excavation and one in the upper uterine segment;

One head in the excavation and one in the iliac fossa;

Distance from pelvic pole to fundal pole over 12 inches;

Two foetal heart-sounds of different rates;

Two foetal heart-sounds of the same rate, but in widely different situations and on opposite sides;

Heart above the umbilicus and head in the excavation;

Rapidly successive presentation of a head and a breech;

Four extremities presenting;

Two amniotic bags at the cervix.

**Diagnosis of Triplets, rarely possible.**

**Superfecundation.** Twin pregnancy resulting from separate acts of insemination by the same or different males.

**Duration of Pregnancy.**

Not definitely known since the interval between insemination and fecundation may vary from 1 to 12 days or more.

Average interval between the beginning of last menstruation and labor is 280 days.

Average interval between the fruitful coitus and labor is 273 days.

A variation of 40 days above or below these averages is possible within physiological limits.

**Rules and Methods for Predicting the Date of Labor.****Naegele's Rule.**

Count forward 9 months from the beginning of the last menstruation and add 7 days.

Usually accurate within a week.

Count 4 1-2 to 5 months from the date of quickening.

Very liable to error.

**Mensuration of the Uterus.**

6th month, 8-9 inches by  $6\frac{1}{2}$  inches; fundus near umbilicus.

7th month, 10 inches by  $7\frac{1}{2}$  inches; fundus midway between umbilicus and ensiform.

8th month, 11 inches by 8 inches; fundus at or near ensiform.

9th month, 12 inches by 9 inches; fundus below ensiform.

Also liable to error.

**Mensuration of the Fœtus.**

Length of the fœtus is approximately double the length of the fœtal ovoid.

Fairly reliable.

Length of the fœtus :

6th month, 12 to 14 inches.

7th " 14 " 16 "

8th " 16 " 18 "

9th " 18 " 20 "

## HYGIENE OF PREGNANCY.

**Hygiene of Pregnancy.** Ordinary hygienic rules are doubly important during gestation, especially in the matter of food, clothing, bathing, sleep and daily open air exercise.

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## PATHOLOGY OF PREGNANCY.

**Pathology of the Decidua.**

Apoplexies. Most common in nephritis, mechanical violence.

Acute endometritis,—hemorrhagic, exanthematous.

**Pathology of the Amnion.**

Deficiency of liquor amnii, oligo-hydramnios.

Excess of liquor amnii, hydramnios; may amount to several quarts. The foetus is liable to be diseased.

Plastic exudation may give rise to adhesion bands and consequent amputation of foetal extremities.

**Pathology of the Chorion.****Myxomatous Degeneration of the Chorion : Vesicular Mole.**

A myxomatous degeneration of the chorial villi resulting in the formation of cysts of the villi.

The cysts are frequently of the size of a grape; may reach the size of a lemon.

The degeneration begins not later than the tenth or twelfth week.

The degenerated ovum may be retained several months.

**Prognosis.**

May become dangerous to the health and even the

life of the patient by hemorrhage or possible perforation of the uterus.

Almost uniformly fatal to the fœtus.

Diagnosis.

Signs of pregnancy.

Abdominal enlargement not corresponding to the period of gestation.

Uterus too large the first three months, later too small.

Absence of ballottement, of the fœtal heart and fœtal movements.

Sanguineous discharge.

Discharge of cysts, rarely.

Physical examination of the uterine contents.

Treatment.

As a rule, empty the uterus.

Tampon and give ergot.

Dilate the cervix and evacuate with the hand and curette, cautiously, as the uterine wall is often extremely thin.

Swab the cavity with tincture of iodine.

Hot douche.



### Pathology of the Placenta.

Placenta Membranacea. Persistence of villi over the entire surface of the chorion.

Placenta Prævia. Implantation in the lower segment.

Placenta Succenturiata. One or more wholly or partially detached cotyledons.

Œdema. May occur in hydramnios, occlusion of umbilical veins, or maternal anasarca.

Apoplexy. Cause, nephritis, pelvic congestion, etc.

Myxomatous degeneration.

Fatty degeneration.

Placentitis, acute.

Tumors, fibroids, organized blood clots.

Syphilis.

Infection by the spermatozoid.

Hyperplasia and hypertrophy of the placental villi.

Infection during the fruitful coitus, or during the early or middle months of gestation.

Endometritis placentaris and syphilitic disease of the villi.

Infection during latter months of gestation.

Placenta usually escapes.

Infection before conception.

Endometritis placentaris gummosa.

The syphilitic placenta is larger and paler than the normal. Always dangerous, frequently fatal, to the fœtus.

### Pathology of the Umbilical Cord.

Length, excess or deficiency.

Occlusion of the vessels by excessive torsion.

Knots.

Hernial protrusions of abdominal viscera into the cord.

## ECTOPIC GESTATION. MISPLACED OR EXTRA-UTERINE PREGNANCY.

### Tubal Pregnancy.

**Cause.** Arrest of the impregnated ovum in the tube from denudation of ciliated epithelium.

**Clinical Course.** The impregnated ovum lodges and develops in the tube, and is expelled at a later date.

**A.** In the free portion of the tube.

**a.** Ruptures almost invariably before the 14th week into

1. Peritoneum. Result, almost certainly fatal by hemorrhage or by suppuration. Spontaneous arrest of hemorrhage is rarely possible.

2. Broad ligament. — Intraligamentous Pregnancy.

May die and be absorbed.

May die and suppurate.

A suppurating ovum may be discharged, piecemeal, through the abdominal wall, vagina, bladder or rectum.

May go to term. At term spurious labor sets in and child dies.

May die and be carried indefinitely as a lithopædion.

May become intraperitoneal by secondary rupture. Secondary rupture is almost uniformly fatal to the child.

b. In rare cases the ovum may die before rupture.

B. In the intramural portion of the tube ;—Interstitial Pregnancy.

Ruptures before the 5th month into the peritoneum, —generally.

Result almost surely fatal.

Rarely is expelled into the uterus.

### Abdominal Pregnancy.

Possible as a rare result of secondary rupture.

Abdominal pregnancy in the sense of primary implantation and development upon the peritoneum is *sub judice*.

### Ovarian Pregnancy.

Possible.

### Diagnosis of Extra-Uterine Pregnancy.

#### *Symptoms.*

Frequently a long period of sterility immediately preceding.

Suppression of the catamenia.

Other signs of pregnancy.

Pain in paroxysms which are abrupt, most violent, supervening upon apparent health, cramp-like in character and generally referred to the seat of the fruit-sac, the more acute paroxysms being attended with collapse and the signs of internal hemorrhage. At the time of rupture, frequently a sense of tearing.

Hemorrhage from the genital organs. Usually in gushes of larger or smaller amount especially at the times of the painful paroxysms. A more or less copious discharge of blood usually attends the rupture of the fruit-sac.

Expulsion of a decidual cast,—having no fœtal villousities.

#### *Physical Signs.*

##### Early months.

Development of the uterus.

Displacement of the uterus according to the size and situation of the fruit-sac.

Cervix open.

A fluid tumor beside the uterus or behind it, tense, pulsating, extremely sensitive, rapidly growing.

Ballottement of the whole tumor in the absence of adhesions,—of its contents in more advanced pregnancy.

Differentiate from salpinx, enlarged ovary, small ovarian cyst, pregnancy in one horn of a double uterus.

Distinguish from the body of a latero-verted uterus.

##### Latter months.

Fœtal movements more distinct than in uterogestation.

Fœtal heart-tones more intense.

Fœtus more accessible to palpation.

Intermittent contractions absent.

Explore the uterine cavity before opening the abdomen.

Intra and extra-uterine pregnancy may coexist.



**Summary of Signs of Extra-Uterine Pregnancy.****Early Months.****General Symptomatology:**

Signs of pregnancy;  
Hemorrhage;  
Decidual cast;  
Pains, with collapse.

**Uterus:**

Displaced;  
Enlarged;  
Empty;  
Cervix open.

**Tumor:**

Tense;  
Tender;  
Pulsating;  
Growing.

Latter Months, as above stated.

**Symptoms of Intraperitoneal Rupture.**

Intense colicky pains.

Profound collapse with the signs of internal hemorrhage.

Later, abdominal tenderness and evidence of moderate peritonitis.

**Treatment of Tubal Pregnancy.****Before Primary Rupture.**

Fœticide by electricity, without puncture.

Faradic Current.

One pole on the abdomen, over the tumor, one in the vagina or rectum beneath it.

Full force of one or two cells.

Sitting half to one hour.

Repeat daily till the tumor shrinks.

Galvanic Current.

Electrodes as above.

Uninterrupted.

50 to 100 milliamperes.

Sitting 15 minutes.

Interrupted, 120 interruptions per minute.

15 to 30 milliamperes.

One sitting may suffice.

Laparotomy, as an alternative, or in case of hemorrhage or sepsis after fœticide by electricity.

**After Rupture into the Peritoneum.**

*Immediate Laparotomy.*

Distinguish between extra and intra-peritoneal rupture by presence or absence of tumor in broad ligament.

*Technique.*

Incision in the median line, 2 or 3 inches in length.

Determine the presence of blood by inspection through the uncut peritoneum or by means of a pipette passed through a minute opening in the peritoneum.

Divide the peritoneum, lift the fruit-sac and the free end of the tube, tie the broad ligament behind the tumor and amputate. Cauterize the cut end of the tube, stay all hemorrhage, cleanse the peritoneal cavity, flushing it freely with plain water at 110° F., and close the abdomen.

Laparotomy being impracticable, treat by quiet, sand bags on the abdomen over the fruit-sac, compression of the aorta.

**After Rupture into the Broad Ligament.**

*Fœtus living.*

Before end of 3rd month, electrical fœticide.

Later, expectant.

*Fœtus dead*, open the cyst, extraperitoneally if possible, through the abdominal wall, if sepsis develops.

**Secondary Rupture**, with dangerous hemorrhage,—treatment as in primary intraperitoneal rupture.

**At or Near Term.**

*Fœtus living.*

Laparotomy. "Primary Laparotomy."

Control the placental site by hemostatic suture.

Remove the placenta and larger part of the sac.

Close remainder of the sac and drain through the vagina or through the abdominal wound.

Or, leave the placenta undisturbed to come away later, stitching the sac to the abdominal wound and draining.

*Fœtus dead.*

Wait for obliteration of the placental vessels, if the patient is doing well, two or three months or indefinitely.

**After Term.**

Laparotomy several weeks after the death of the fœtus, "Secondary Laparotomy," or only on the development of dangerous symptoms.

**Interstitial Variety.** If diagnosis is possible, may sometimes be safely terminated by evacuating the fruit-sac through the uterine cavity.

On rupture, laparotomy is indicated as in ordinary tubal pregnancy, and in certain cases supravaginal amputation of the uterus may be required.

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## ABORTION AND PREMATURE LABOR.

**Definition of Terms.**

*Abortion*, expulsion of the ovum in the first three months.

*Miscarriage*, expulsion of a non-viable fœtus after the third month.

The terms abortion and miscarriage are commonly used interchangeably.

*Premature Labor*, the premature birth of a viable fœtus.

**Abortion.**

**Frequency.** Occurs in about 10% of all pregnancies.

A large proportion of abortions occur at the end of the second month.

**Causes.****1. Death of the Fœtus from***Fœtal Lesions:*

Developmental;  
 Infectious diseases;  
 Mechanical violence.

*Placental Lesions:*

Acute anæmia;  
 Insufficient development of the decidua;  
 Endometritis or metritis, from misplacement or otherwise;  
 Fevers;  
 Metallic impregnation,—lead, mercury;  
 Disease of the cord;  
 Syphilis, through disease of the decidua or chorion or both;  
 Other diseases of the chorion.

**2. Placental Lesions, acting directly.**

## Arising from

Reflex irritation of the uterus:

Mammary;  
 Ovarian;  
 Mental shock;  
 Chorea;  
 Pruritus vulvæ;  
 Rectal irritation;  
 Undue irritability, and other causes.

Oxytocics.

Placenta prævia;

Epileptiform convulsions from uræmic or other causes;

Carbonic dioxide poisoning;

Albuminuria, causing placental apoplexies and maternal toxæmia;

Pelvic adhesions;

Fibroids of the uterus;

Carcinoma of the uterus;

Misplacement of the uterus;  
Over distention from hydramnion or multiple pregnancy.

Direct interference;

Other mechanical violence as falls and blows;

Hyperæmia of the pelvic organs from circulatory obstruction in the lungs or liver, cardiac disease, violent muscular exertion, sexual excesses, etc., causing hemorrhage into the placenta;

Other causes.

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#### Diagnosis.

##### Symptoms:

Hemorrhage;

Rhythmical uterine pains;

Chill.

##### Physical Signs:

Cervix softening;

Cervix dilating;

Ovum protruding.

The physical signs make the diagnosis of inevitable abortion.

Severe rhythmical pains with hemorrhage almost certainly result in abortion.

Examine clots,—breaking them up under water,—for fœtus or fœtal appendages.

#### Prognosis.

Always favorable in good hands, yet many deaths occur from mismanagement;

Dangers, hemorrhage, septicæmia;

Hemorrhage contributes to the fatal issue though rarely the immediate cause of death.

#### Treatment.

1. Prophylaxis in case of habitual abortion;
2. Arrest of threatened abortion;
3. Management of actual abortion;
4. After-treatment.

**Prophylaxis**, or management of cases with a history of previous abortions.

Seek the cause of former abortions.

Syphilis, misplacements of the uterus and nephritis the most frequent causes of habitual abortion.

Treat syphilis as in other cases. Correct uterine misplacements.

In chronic nephritis the uterus should generally be emptied.

Guard the menstrual dates.

Avoid the causes of pelvic congestion till the critical period has passed.

#### **Arrest of Threatened Abortion.**

Absolute rest, maintaining a recumbent position.

Uterine rest.

To this end, rectal use of opium, 1 gr., or its equivalent, p. r. n., or,

Pil. extract. viburni prunifolli, 4 grs. q. 2 h.

Remove the causes.

In case of dead fœtus or vesicular degeneration of chorion, empty the uterus.

#### **Management of Actual Abortion.**

Chief objects of treatment the prevention of

1. Hemorrhage;
2. Septicæmia.

Agents for controlling hemorrhage:

1. Rest;
2. Vaginal tampon, simple or styptic.

Must be aseptic. Renew every six hours, or use cotton impregnated with oxide of zinc, which may stand 24 hours;

3. Cervical tampon together with vaginal;
4. Evacuation of the uterus as soon as the ovum is separated, or nearly so, by the aseptic finger or curette.

Means for preventing or arresting sepsis:

1. Continuous disinfection of the uterus;
2. Avoidance of preventable lacerations and abrasions;
3. Evacuation of the uterus.

#### **Expectant Plan.**

##### *Indications.*

Ovum not detached;

Hemorrhage slight ;  
No putrilage.

*Method:*

Maintain asepsis.

Aseptic vaginal tampon may be used if required as a prophylactic against hemorrhage.

This plan failing, after two or three days empty the uterus with curette and forceps.

Sooner for cause.

**Radical Plan.**

*Indications.*

Cervix dilated.

Ovum detached or presenting.

Much hemorrhage.

Sepsis imminent.

*Manual Method:*

Anæsthetic if necessary;

Depress and fix the uterus by one hand over the abdomen;

Empty the cavity with one or two fingers of the other hand aseptically.

*Instrumental Method:*

Sims' position, Sims' speculum, dressing forceps with joint  $2\frac{1}{2}$  inches from the distal end;

Sterilize the vagina and the uterine cavity;

Separate the ovum with the curette;

Extract with the dressing forceps;

Curette the uterine cavity;

Douche the cavity with a hot mercurial solution and follow with plain hot water;

Swab with tr. iodin. in case of hemorrhage not controlled by the curette;

Leave 30 grs. of iodol or iodoform in the uterus.

**After-Treatment.**

Rest in bed for one or two weeks.

Maintain asepsis.

**Premature Labor.** Management same as in term labors.

**Signs of Death of the Fœtus.**

First half of pregnancy:

Recession of the signs of pregnancy;

The bimanual,—uterus inelastic;

Peptonuria.

Last half of pregnancy:

Absence of the fœtal heart;

Absence of active fœtal movements;

Looseness and crepitation of cranial bones.

**Fleshy Mole.**—Consists of a retained ovum of less than three months' development, of which the embryo has died and become absorbed.

Treatment: Empty the uterus.

**Hyperemesis: Pernicious Vomiting.**

**Pathology.**

In part a neurosis.

Severest forms probably never uncomplicated.

**Complications.**

**Uterine Lesions:**

Misplacements;

Detention in the pelvis, by adhesions or otherwise;

Decidual endometritis;

Induration of the cervix;

Erosion or inflammation of the cervix.

**Non-uterine Lesions:**

The ordinary causes of vomiting:—intracranial, gastric, hepatic, intestinal, peritoneal, renal and others.

**Prognosis.**

The majority of cases recover by the third or fourth month, when the uterus rises out of the pelvis.

Prognosis is grave in the worst forms.



**Treatment.**

Treat with reference to the cause if possible.

*Dietetic Measures:*

  Humor the appetite;

  Breakfast in bed followed by sleep;

  Sherry wine before rising;

  Strong coffee before rising;

  Cold carbonic acid water or Vichy, plain or containing an alkaline bromide, 1 drachm to the syphon;

  Champagne, cold;

  Other dietetic measures as practised in ordinary vomiting.

*General Therapy:*

  Cocaine, gr. 1-8th to 1-4th, three or four times daily, or hourly till three or four doses are taken;

  Cocaine spray to the pharynx, 1% solution;

  Chloral, gr. xx to xxx in solution, by the rectum, repeated p. r. n.;

  The bromides in like manner;

  Morphia, hypodermically or endermically, over the epigastrium, especially if there be local tenderness.

  Strychnia or nux vomica before meals, in chronic gastric catarrh;

  Calomel in full dose or in small repeated doses.

  Oxalate of cerium, gr. x. q. 2 vel 4 h., in mild cases;

  Ether spray to the epigastrium at the beginning of each paroxysm;

  Ice bag to the cervical vertebræ;

  Blister over the 4th or 5th dorsal vertebræ;

  Inhalation of oxygen;

  Faradic current through the stomach;

  Other measures such as are used in the treatment of ordinary vomiting.

*Local Measures:*

  Treat local lesions;

  Correct malpositions of the uterus;

  Cocaine, 20% solution, on and within the cervix;

Combine with cocaine, Copeman's method of dilatation of the cervix below the os internum.

This treatment may result in abortion;

Artificial Abortion as a last resort.

This procedure must never be adopted except with the concurrence of competent council.

Method:—Puncture of the membranes or partial separation of the ovum with a sound.

Rectal Alimentation may tide the patient over a crisis when stomach-feeding is impossible.

Beef blood, beef juice, Leube's meat solution or predigested milk, 4 ounces, q. 4 h. Small doses of opium may sometimes be added to the nutrient enemas with advantage.

Wash out the rectum daily.

### **Ptyalism.**

Saturated solution of potassium chlorate as a mouth-wash.

Atropia, gr. 1-64th, once to three times daily.

Bromides, gr. xxx to cxx daily.

Treatment generally unsatisfactory.

### **Anæmia.**

Iron, pil. Blaud, 1 or 2, t. i. d.; albuminate of iron in liberal doses.

Citrate of iron, subcutaneously.

Arsenic, gr. 1-40th to 1-20th, t. i. d.

Generous diet.

### **Varices of the Lower Extremities.**

Support by bandage or elastic stockings.

### **Pruritus Vulvæ.**

Exclude diabetes.

Hot fomentations to the vulva.

Dust the vagina and vulva with subnitrate of bismuth.

In pruritus from parasitic causes, vaginal injections and vulvar lotions of the bichloride of mercury, 1 to 2000.

## LABOR.

### LABOR.

#### Factors :

- I. Powers;
- II. Passages;
- III. Passenger.

#### I. Expelling Powers :

1. Muscular action of the uterus,—involuntary, the sympathetic being the chief motor nerve of the uterus. Peristaltic but nearly simultaneous,—beginning at the fundus probably.

2. Muscular action of the abdominal walls,—voluntary in part, partly a reflex involuntary contraction.

Chief expelling force the contraction of the unstriped muscular fibers of the uterus.

Proof, labor in paraplegic women, under anæsthesia, and the powerlessness of the abdominal muscles alone in inertia uteri.

Power of the uterine contractions, 50 to 80 lbs., together with the abdominal muscles,—Duncan; according to Schatz, 17 to 55 lbs.

#### II. Passages :

1. Hard Parts: Bony Pelvis;
2. Soft Parts.

#### Obstetric Anatomy of the Bony Pelvis.

##### Constituent Parts :

Ossa innominata;  
Sacrum;  
Coccyx.

##### Joints:

Symphysis pubis;  
Sacro-iliac joints;  
Sacro-coccygeal joint.

A slight mobility of the pubic joint is usually present in the latter months of gestation.

Recession of the coccyx during expulsion of the foetal head from the outlet,  $\frac{1}{2}$  to 1 inch.

#### **False and True Pelvis, or Greater and Lesser Pelvis.**

All above the ilio-pectineal line is false pelvis, all below, true pelvis.

The false pelvis with the abdominal wall forms a funnel-shaped approach to the true pelvis.

#### **True Pelvis.**

*Brim: Inlet: Superior Strait: Isthmus: Margin.*

Located by the linea terminalis and the upper border of the sacrum.

Shape, approximately heart-shaped.

#### **Landmarks at the Brim:**

Promontory of the sacrum, or sacro-vertebral angle; due to the wedge shape of the last lumbar cartilage and of the fifth lumbar vertebra;

Sacro-iliac joints;

Ilio-pectineal eminences situated at the ilio-pubic joint, on the pubic bone;

Symphysis pubis.

*Outlet of the Pelvis, or Inferior Strait.* Lozenge-shaped and bounded by the tip of the coccyx, the subpubic arch and the ischial tuberosities.

A double triangle whose common base is a line connecting the ischial tuberosities, the apex of one the pubic arch, the other, the tip of the coccyx or, better, the sacrum.

#### **Landmarks at the Outlet:**

Tip of the coccyx;

Subpubic arch;

Ischial tuberosities;

Ischial spines.

The greater and lesser sacro-sciatic ligaments assist in completing the parturient canal partly formed by the bones.

The greater arise from the posterior, inferior spines of the ilium and from the sides of the sacrum and coccyx, and are inserted into the inner surfaces of the ischial tuberosities.

The lesser arise from the sides of sacrum and coccyx, and are inserted into the spines of the ischium.

Obturator membrane.

*Cavity.* Bounded posteriorly, in the main, by the sacrum and the coccyx.

Anteriorly, by the pubes, the pubic and ischial rami.

Laterally, by the surfaces of the iliac and ischial bones.

The posterior wall is smooth, and concave from above downward. Its depth is 4 to 5 inches,— $5\frac{1}{2}$  measured on the curve.

The anterior wall is smooth, and concave from side to side. Its depth at the symphysis pubis is  $1\frac{1}{2}$  inches.

*Planes.* The plane of the brim cuts the ilio-pectineal line, the upper border of the sacrum and the upper end of the symphysis pubis.

Inclination of the brim to the horizon is about  $60^{\circ}$ , but is variable.

The middle plane cuts the middle of the posterior surface of the pubic symphysis and the upper margin of the third piece of the sacrum.

The plane of the outlet cuts the tip of the sacrum, a point just below the lower end of the symphysis pubis, and the ischial tuberosities.

A line from the tip of the coccyx to the subpubic arch makes an angle of about  $11^{\circ}$  with the horizon.

#### **Pelvic Diameters and Measurements.**

##### *Internal Diameters:*

##### **At the Brim:**

True Conjugate, from the promontory of the sacrum to the upper end of the symphysis,—more exactly to a point on the symphysis crossed by the linea terminalis.

Diagonal Conjugate, from the promontory of the sacrum to the summit of the subpubic arch.

Transverse Diameter, the greatest transverse diameter. It cuts the points midway between the sacro-iliac joints and the ilio-pectineal eminences.

Oblique Diameters, from the sacro-iliac joints, respectively, to the opposite ilio-pectineal eminence. R.

O. from the right, L. O. from the left sacro-iliac joint.

At the Middle Plane.

Antero-posterior Diameter, from the upper margin of the third piece of the sacrum to the middle of the posterior surface of the pubic symphysis.

Transverse, between points corresponding respectively to the lower margins of the acetabula.

Oblique, from the center of the greater sacro-sciatic foramen to the center of the obturator membrane opposite.

At the Outlet.

Antero-posterior Diameter. Lower margin of the pubic symphysis, or a point just below it, to the tip of the sacrum,—or as usually defined, from the lower end of the pubic symphysis to the tip of the coccyx.

Transverse. Between the tubera ischiorum.

Oblique. Middle of the lower edge of the greater sacro-sciatic ligament to the point of union between the ischium and pubes on the opposite side.

### *External Diameters:*

External Conjugate Diameter.

From the fossa just below the spinous process of the last lumbar vertebra to the most prominent point on the surface overlying the upper portion of the pubic symphysis. A prolongation of the internal conjugate.

Ilio-spinal or Inter-spinal Diameter.

The distance between the anterior superior spines of the ilia measured from the inner borders of the sartorii at their origin.

Ilio-cristal or Inter-cristal Diameter.

In the normal pelvis the greatest external diameter of the pelvis measured transversely at the crests.

#### Measurements of the Static or Dried Pelvis.

Internal,—Approximate Values:

Antero-posterior	Oblique	Transverse
Brim, 4 inches	4½ inches	5 inches.
Outlet, 5 “	4½ “	4 “

The right oblique diameter at the brim is slightly longer than the left oblique.

#### Measurements of the Dynamic Pelvis.

##### *Internal:*

The internal diameters are diminished  $\frac{1}{4}$  inch by the presence of the soft parts in the dynamic pelvis.

The transverse diameter at the brim is still more reduced by the psoas and iliacus muscles.

The oblique diameter is the longest, in the dynamic pelvis.

The capacity of the dynamic pelvis is still further reduced by the contained viscera and the cellular structures.

##### *External:*

External conjugate, 8 inches;

Ilio-spinal, 10 inches;

Ilio-cristal, 11 inches.

To estimate the internal conjugate from the external, deduct from  $2\frac{3}{4}$  to 5 inches for the thickness of the bony structures and overlying soft parts.

#### Difference Between the Male and Female Pelvis.

Distinguishing marks of the female pelvis:

As a whole:

False pelvis wider;

True pelvis larger in all diameters and of shallower depth;

Bones lighter and more slender;

Pelvic inclination greater;

Brim: Sacro-vertebral angle less prominent;

Pubic spines farther apart.

Cavity:

Sacrum shorter and broader;

Cavity less funnel-shaped.

Outlet:

Greater width of subpubic arch,—75°;

Male, 58°;

Symphysis pubis little more than half the depth of the male.

### Obstetric Anatomy of the Pelvic Soft Parts.

At the Brim: The iliacus and psoas muscles encroach upon the lateral margins of the inlet to the extent of  $\frac{1}{4}$  inch, or more, on each side.

The external iliac vessels lie on the inner border of these muscles.

In the Cavity: There are no muscular structures over the median portion of either the anterior or posterior pelvic walls.

On either side of the median portion lie the pyramidalis,\*posteriorly, and the obturator internus, anteriorly, too thin to affect the pelvic diameters.

At the Outlet: The outlet is closed by the pelvic floor or diaphragm which is made up chiefly of muscles and fasciæ.

#### *Pelvic Floor :*

The upper aspect of the pelvic floor is concave, its lower, convex from before backward.

Its upper limit is the peritoneum except where that structure is lifted off to be reflected over the pelvic viscera and their appendages. Its lower surface is skin.

At its median portion it is obliquely traversed by three muscular slits, the urethra, the vagina, the rectum, all approximately parallel with the pelvic brim, except that the lower end of the rectum turns backward nearly at a right angle with the vagina.

The posterior vaginal wall and the soft structures behind it constitute the sacral segment of the pelvic floor of Hart;



The anterior wall of the vagina and the soft parts in front of it, the pubic segment of the pelvic floor.

Measurements:

Coccyx to anus, in the nullipara,  $1\frac{3}{4}$  inches; anus to posterior commissure, in the nullipara,  $1\frac{1}{4}$  inches; in parous women, 1 inch; in gravid women at term,  $1\frac{1}{2}$  inches.

Greatest transverse width, on the bis-ischial line,  $4\frac{1}{4}$  inches.

Perpendicular thickness of the pelvic floor at the anus, 2 inches.

Average projection of the pelvic floor, below a line drawn from the tip of the coccyx to the lower end of the symphysis, is about 1 inch.

Length of the sacral segment during labor at the moment of expulsion,—coccyx to posterior commissure,—is  $6\frac{1}{4}$  inches.

Principal Component Structures:

Internal or Superior Pelvic Fascia, continuous with the iliac fascia.

Levator Ani Muscle: each lateral half of the levator ani arises from the horizontal ramus of the pubes, from the ischial spine and from the fascia between these points. The lateral halves pass downward and backward, a portion of their fibers going to the coccyx, one bundle uniting with its companion behind the rectum, a portion passing to the lateral aspect and another to the anterior wall of the rectum, near the anal orifice. The anterior or lowermost bundles pass to the lateral walls of the vagina.

The Coccygeus: Origin, the ischial spine; insertion, the side of the coccyx and the lower portion of the sacrum.

These two muscles constitute the deep muscular layer of the pelvic floor.

They lie immediately below the internal pelvic fascia. The former is the most important muscle of the pelvic diaphragm.

The Sphincter Ani lies below the plane of these muscles.

Below the sphincter ani is the skin.

The foregoing structures belong to the posterior portion of the pelvic floor, the anterior limit of which is the bis-ischial line.

The anterior region of the pelvic floor lies in front of this line and comprises the deep, middle and superficial perineal fascia, and, between the last two fascial layers, the transversus perinei, the bulbo-cavernosus and the ischio-cavernosus muscles.

The Transversus Perinei: Origin, the ischial tuberosity; insertion, the perineal body.

The Bulbo-Cavernosus: Origin, the anal sphincter and perineal fascia at the right and left of it; insertion, the lower aspect of the clitoris, the posterior surface of the bulb and the mucous membrane of the vestibule.

The Ischio-Cavernosus: Origin, the ischial tuberosity and ischio-pubic ramus; insertion, the crus clitoridis.

The Perineal Body is the mass of elastic and muscular tissue between the lower end of the vagina and the rectum. Height,  $1\frac{1}{2}$  inches. Length of base, antero-posteriorly,  $1\frac{1}{4}$  inches,—in the nullipara.

### The Parturient Axis.

Axis of the Inlet: A line perpendicular to the plane of the brim at its central point; its prolongations cut the umbilicus and the tip of the coccyx.

Continuous with the axis of the uterus.

Axis of the Outlet: The perpendicular to the plane of the outlet at its middle point, cutting, if prolonged, the promontory of the sacrum and the anus.

Axis of the Outlet of the Soft Parts: axis of expulsion,—looks almost directly forward.

Axis of the Parturient Canal is an irregular parabola.

### III. Passenger.

A factor by reason of its

Shape, especially of the head;

Size, especially of the head;  
 Presentation;  
 Position;  
 Posture.

### **Obstetric Anatomy of the Fœtal Head.**

The Cranial Vault is plastic owing to the semi-cartilaginous character and mobility of its bones.

The Cranial Base and Face are firm and unyielding, since the bones of this region are more highly ossified and more firmly united.

**Bones of the Cranial Vault :** 1 occipital, 2 parietal, 2 frontal, 2 temporal.

#### **Sutures :**

Sagittal or inter-parietal;  
 Frontal or inter-frontal;  
 Coronal or fronto-parietal;  
 Lambdoidal or occipito-parietal.

#### **Fontanelles :**

Anterior, or Large Fontanelle, or Bregma:

At the anterior extremity of the sagittal suture;  
 Kite-shaped or quadrangular ;  
 Anterior angle most acute and elongated ;  
 Average diameter, one inch ;  
 Four lines of sutures run into it.

Posterior Fontanelle :

At the posterior extremity of the sagittal suture ;  
 Triangular ;  
 Small, usually a mere depression barely perceptible to the finger tip;  
 Three lines of sutures running into it ;  
 Behind it the squamous or triangular portion of the occipital bone is movable upon the basilar portion by a hinge-like joint of fibrous tissue.

#### **Protuberances:**

Occipital,—one inch or more behind the posterior fontanelle.

Parietal eminence or bos,—at the center of each parietal bone.

Frontal,—at the center of each frontal bone.

Vertex :—that portion of the head lying between the fontanelles and extending laterally to the parietal eminences.

Occiput :—that portion of the head lying behind the posterior fontanelle.

Sinciput :—that portion of the head lying in front of the bregma.

Measurements of the Fœtal Head :—Approximate Values:

BIPARIETAL DIAMETER :—Through the parietal eminences,  $3\frac{1}{2}$  inches.

FRONTO-MENTAL DIAMETER :—From the summit of the forehead to the center of the lower margin of the chin,  $3\frac{1}{2}$  inches.

OCCIPITO-FRONTAL DIAMETER :—From the tip of the occipital protuberance to the root of the nose,  $4\frac{1}{2}$  inches.

OCCIPITO-MENTAL DIAMETER :—From the tip of the occipital protuberance to the center of the lower margin of the chin,  $5\frac{1}{2}$  inches.

SUBOCCIPITO-BREGMATIC DIAMETER :—From the junction of the nucha and occiput to the center of the bregma,  $3\frac{3}{4}$  inches.

BITEMPORAL DIAMETER :—Between the lower extremities of the coronal suture,  $3\frac{1}{8}$  inches.

BIMASTOID DIAMETER :—Between the mastoid apophyses,  $2\frac{3}{4}$  inches.

CIRCUMFERENCE :—Suboccipito - bregmatic circumference, about 13 inches.

In male,  $\frac{1}{2}$  inch greater than in female heads.

#### Trunk Diameters :

Bis-acromial,  $4\frac{3}{4}$  inches.

Bis-trochanteric,  $3\frac{1}{2}$  inches.

The trunk diameters are much more compressible than the cephalic.

#### Presentation.

Definition: Relation of the long axis of the fœtal ovoid to the uterine axis.

## VARIETIES:

1. *Longitudinal*;

Cephalic,—including

a. Vertex;

b. Face;

c. Brow;

Pelvic,—including

Breech,

Feet.

2. *Transverse*, including

Shoulder,

Arm,

Other rarer presentations.

Relative Frequency,—at term.

Cephalic, 97% or more.

Pelvic, 2% or less.

Lateral, 1% or less.

Causes for preponderance of the cephalic presentation are adaptation, and, probably, gravity.

*Presenting Part*.—That part of the foetal ovoid which offers at the pelvic brim.**Position.**

Definition:—Relation of the presenting part to certain anatomical landmarks at the pelvic brim.

## VERTEX POSITIONS:

Left occipito-anterior;—L. O. A.;

Right occipito-anterior;—R. O. A.;

Right occipito-posterior;—R. O. P.;

Left occipito-posterior;—L. O. P.

Relative Frequency: 70% , 10% , 17% , 3% , respectively.

## FACE POSITIONS:

Left mento-anterior;—L. M. A.;

Right mento-anterior;—R. M. A.;

Right mento-posterior;—R. M. P.;

Left mento-posterior;—L. M. P.

## BREECH POSITIONS:

Left sacro-anterior;—L. S. A.;

Right sacro-anterior;—R. S. A.;

Right sacro-posterior ;—R. S. P.;  
 Left sacro-posterior ;—L. S. P.

TRANSVERSE OR SHOULDER POSITIONS:

Left scapula-anterior ;—L. Sc. A.,—(Sc. L. A., Simpson) ;

Left scapula-posterior ;—L. Sc. P.,—(Sc. L. P., Simpson) ;

Right scapula-posterior ;—R. Sc. P.,—(Sc. D. P., Simpson) ;

Right scapula-anterior ;—R. Sc. A.,—(Sc. D. A., Simpson).

Terms right and left refer to the mother.

**Posture.**

Definition:—Relation of the fœtal members to one another.

Normal posture, one of flexion.

In Cephalic Presentation:—Extreme flexion of the head is the most favorable posture, since the head thus engages by its smallest diameters.

Extreme extension (face presentation), not so favorable.

Semi-extension (brow presentation) or incomplete flexion, unfavorable.

In Breech Presentation:—Either breech, knee or foot may present, according to posture.

In Shoulder Presentation:—Either shoulder, elbow or hand may present.

**Classification of Labor.**

**Normal** :—The mechanical factors all normal and no complication.

**Abnormal** :—One or more of the factors abnormal.

**Complicated** :—Dangerous to the mother or child, or both, by reason of some accident independent of the mechanical factors.

## NORMAL LABOR: PHYSIOLOGY OF LABOR.

**Mechanism.**

Movements of the Head :

**Descent :—**Driving force, the action of the uterine and abdominal muscles.

**Flexion:** Cause :

Before engagement in the utero-cervical canal there is a certain degree of primary flexion ;

After engagement:

1. Adaptation;
2. Unequal lengths of occipital and frontal arms of the lever.

Accommodation is still further promoted by moulding of the head.

**Rotation :** Cause :

1. Adaptation;
2. Slope of the lateral halves of the pelvic floor, downward, forward, inward.

That pole of the foetal head which first lands upon one lateral half of the pelvic floor glides downward, forward and inward under the pubic arch.

Complete flexion and moulding favor rotation.

**Extension :** Cause: Adaptation.

**Restitution :** Cause : Torsion of neck,—untwisting.

Shoulders and breech rotate in similar manner to the head, but less perfectly.

**Physiological Phenomena.**

Cause of onset, obscure.

Premonitory Symptom, lightening, occurring generally within ten days of labor; not constant.

**Phenomena of Beginning Labor :**

Irritability of the bladder and rectum ;

Show; not constant;

Expulsion of mucous plug ;

Rhythmical uterine pains.

At first pelvic tenesmus and lumbo-sacral pains.

Later, pains felt toward the pubic region, radiating down the thighs.

The uterus hardens with each pain.

#### Stages of Labor :

1. STAGE OF DILATATION :—Ends with the complete canalization of the utero-cervical zone.
2. STAGE OF EXPULSION :—Ends with the birth of the child.
3. PLACENTAL STAGE :—Ends with the complete evacuation of the uterus, and permanent retraction.

#### 1. Stage of Dilatation.

Dilatation is accomplished by the traction of the longitudinal muscular fibers of the upper uterine segment, and the hydrostatic pressure of the bag of waters.

By the traction of the longitudinal fibers of the uterus the lower uterine segment is pulled upward over the lower segment of the ovum.

With unbroken membranes, the ovum is peeled off from the lower uterine segment, and protruded as dilatation progresses.

This protruding portion of the membranes forms the *bag of waters*.

In vertex presentation it has a watch-glass shape.

The contained liquor amnii is the fore-waters in distinction from that above the head, termed the hind-waters ;

The protruding bag of membranes acts in some degree as a dilating fluid wedge.

The bladder and the whole pubic segment of the pelvic floor begin to be drawn upward during the latter part of the stage of dilatation.

The vessels of the cervix, unsupported by pressure, become engorged, and the cervical tissues loosened by serous infiltration, thus favoring relaxation or dilatation of the cervical canal.



The cervix is at first obliterated with each pain, and restored in the intervals.

Subsequently permanent obliteration of the cervix is established, the ovum resting against the os externum.

From this time the progress of canalization is marked by the expansion of the os externum.

During the first stage the upper uterine segment becomes thickened by retraction of the muscular structures, and the lower segment correspondingly thinned. The line of demarkation between the thickened upper and the thinned lower segment is the *retraction ring*.

The bag of membranes ruptures normally on completion of the first stage.

Frequently it ruptures sooner, or only on interference.

*Pains or Labor Pains*;—Definition, painful uterine contractions of labor.

Cause of the pain, pressure on the nerve filaments of the uterus.

Duration of contraction, 30 to 60 seconds.

Intervals, at the beginning of labor, about 30 minutes, gradually shortening as labor progresses; may be reduced to a fraction of a minute at the close of the second stage.

The intensity progressively increases.

Rarely the first stage is painless.

Frequently first-stage pains are not as well borne as the severer pains of the second stage.

Average Duration of the First Stage:

In primiparæ, 15 hours;

In multiparæ, 11 hours.

## 2. Stage of Expulsion.

The driving force is the action of the uterine and abdominal muscles.

Membranes unbroken, the expelling forces act to extrude the entire ovum.

Membranes broken and fœtus consolidated, the expelling forces act directly upon the fœtal ovoid.

Lubrication of the passages is accomplished by the increased secretions and by the liquor amnii.

The intensity of the pains is augmented by the pressure of the presenting pole upon the vaginal walls, and especially at the vulvar outlet,—at the perineal stage of labor.

Pains of the expulsion stage are distinguished by their bearing-down character.

An œdematous tumor is developed upon the presenting part of the fœtal head as it engages,—the *caput succedaneum*.

The head is moulded by elongation in the direction of the birth-canal, with a corresponding reduction of its engaging diameters.

Generally the head advances with the pains and recedes in the intervals.

The sacral segment of the pelvic floor is relaxed, elongated, and thrust downward and backward in front of the advancing head.

The anal orifice is dilated owing to the relaxation of its sphincter.

The length of the sacral segment (from the coccyx to the posterior commissure) is increased to 5 or 6¼ inches at the moment of expulsion.

A short pause generally follows the birth of the head.

A gush of bloody water usually attends the expulsion of the trunk.

Average Duration of the Second Stage:

Primiparæ, 2 hours ;

Multiparæ, 1 hour.

### 3. Placental Stage.

Events :

#### 1. Separation of the Placenta:

From contraction of the placental site and extruding force of the uterine contractions.

## 2. *Expulsion of the Placenta:*

Due to the extruding force of the uterine contractions.

Sometimes expelled edgewise, presenting by its margin :

Sometimes it presents by its amniotic surface, flat-wise.

## 3. *Retraction of the Uterus:*

Accomplished by repeated contractions, and consists in a rearrangement of its muscular fibers, by which the walls are thickened and shortened.

Duration of the placental stage is 20 to 30 minutes or more.

Retraction securely ligates the uterine vessels torn across on separation of the placenta.

After-Pains :—The intermittent contractions of the uterus after labor are termed after-pains.

## *Average Length of Normal Labor:*

In primiparæ, 17 hours ;

In multiparæ, 12 hours.

## **Management of Normal Labor.**

### **Preparatory :**

Keep the patient under observation during at least the latter months of pregnancy.

Enforce hygiene.—Fortify the health and strength.

Urine should be examined weekly during last one or two months, earlier and oftener for cause.

Nipples should be cleansed daily, and, if sunken, may be drawn with the fingers,—during last month.

### **Obstetric Armamentarium.**

Obstetric Forceps, Catheter,—soft rubber, Hypodermic Syringe, Fountain Syringe, Uterine Douche-Tube, Needles, Needle-Forceps, Aseptic Sutures, Hand Brushes—Sims' Speculum, Volsella, Curette.

Squibb's Chloroform, Chl'oral, Squibb's Ergot, Morphia tablets, gr.  $\frac{1}{8}$ , Ext. veratri viridis fl., Antiseptic tablets of the biniodide or bichloride of mercury.

**Hygiene of the Lying-in Room.**

A southern exposure is desirable.

Continuous ventilation is imperative.

An open fire is a good ventilator.

The room, the bedding, and the clothing of the patient should be surgically clean.

**Preparation of the Bed.**

Spread over the mattress a rubber sheet large enough to cover the entire width of the bed and the larger part of its length. Cover this with a clean muslin sheet and pin fast to the bed. Spread over this a second rubber covered with a muslin sheet. Place on this again three clean muslin sheets, twice folded, in position to absorb the discharges.\*

**Examination of the Patient.****Preliminary Examination :—A Month before Labor.***Abdominal:*

Presentation;

Position;

Posture;

Twins;

Hydramnion.

**Method:**

Locate.

Small parts;

Dorsal plane.

Differentiate foetal poles by

Situation;

Size;

Shape;

Hardness;

Ballottement of head,—in upper segment.

**Locate**

Cephalic prominence;

Anterior shoulder;

\* A large antiseptic pad of prepared jute, or other absorbent material, covered with cheese cloth, or a Kelly rubber pad, may be used to receive the discharges in place of the folded sheets.

Fœtal heart;

Fœtal movements,—feet.

*Vaginal:*

Antiseptic precautions as in examination during labor.

Pelvis ample, contracted or obstructed.

**Examination during Labor.**

**1. Verbal:**

Precursory signs:

Lightening;

Irritability of the bladder and rectum.

Signs of actual labor:

Irritability of the bladder and rectum;

Show;

Expulsion of mucous plug;

Rhythmical pains in the lumbo-sacral and lower abdominal regions.

**2. Abdominal:**

Presentation;

Position;

Posture;

Fœtal pulse-rate, etc.

**3. Pelvic:**

**Antiseptic Precautions:**

Let the nurse, after sterilizing her own hands, cleanse the external genitals of the patient with soap and hot water,—remove the soapy water and bathe the parts with one of the mercurial solutions.

Give an antiseptic vaginal douche in case of foul secretions.

A suitable antiseptic for this purpose is chlorinated soda, 1 in 10, or one of the mercurial solutions. The latter, however, should be immediately followed with a plain water douche to wash out the mercurial.

**Technique of Hand-Cleaning.**

Clean the nails dry.

Scrub the hands and arms thoroughly with soap and hot water and a hand-brush for several minutes.

Rinse off the soap with clean water.

Scrub with one of the mercurial solutions, and another hand-brush for several minutes.

Give special attention to the finger tips, particularly the free edges of the nails.

Wet well with 95% alcohol.

Finally hold the hands for a few minutes in the antiseptic solution.

Use as a lubricant for the hands either the sterilizing solution, or a 1 in 2000 solution of mercuric iodide in glycerine.

To prevent recontamination, touch nothing that is not aseptic.

Dip the hand for a moment in the antiseptic solution before each subsequent examination.

The nurse should cleanse her hands as the doctor does, before touching the genitals.

#### **Sterilizing Solutions.**

Hydrarg. Biniodid., 1 part in 2000 of water. Add one part of iodide of potassium to promote the solution of the biniodide.

Hydrarg. Bichlorid., 1 part in 2000. Add one part of chloride of ammonium or sodium for each of the bichloride.

The bichloride solution should be acidulated with acid. tart., 5-1000, to prevent precipitation of the mercurial in the presence of albuminous fluids.

Cloths, utensils, instruments, etc., may be sterilized by exposure for 20 minutes to a dry heat of 234° F. (112° C.) (baking in an oven);—or, except metallic instruments, by the use of one of the above-named solutions. Boiling or steaming for 30 minutes is sufficient for all practical purposes.

#### **Note in Order the Condition of the**

Vulva,—old injuries, rigidity, œdema?

Vagina,—well lubricated?

Rectum and Bladder,—full or empty?

Bony pelvis,—especially diagonal conjugate.

Cervix,—old injuries, dilatable? How much dilated?

Membranes,—ruptured or not?—watch-glass or glove-finger protrusion?

Presentation—Examine all accessible parts, taking plenty of time;

Position,

Posture,

Stage of progress.

Diagnosticate,

Vertex presentation by the hard and globular character of the fœtal head, and by the sutures and fontanelles.

Position, by locating the sagittal suture and finding which end is forward.

Posture by the relative descent of the fontanelles.

Stage of progress, in the first stage, by the degree of expansion of the cervix; in the second, by comparing the situation of the leading pole,—occiput,—with the landmarks of the birth-canal.

Statement of prognosis must generally be more or less guarded. Should be made as definite as possible.

#### **Management of the Stage of Dilatation.**

##### *For Relief of Severe Pains:*

Chloral, 1 drachm, in doses of gr. xx, every 15 minutes;

Opium, rarely, gr. 1, or equivalent dose of morphia or codeia;

Chloroform, very rarely, in the latter part of the first stage.

##### *Frequency of Vaginal Examination:*

Should be as infrequent as practicable (1 to 4 hours); May in many cases be omitted altogether.

Instruct the patient not to keep the bed, not to bear down with the pains, and to keep the bladder and rectum empty. Prescribe the diet.

Except in very slow labor, remain with patient after the os externum reaches the size of a silver dollar.

Never hurry the first stage, except when necessary to avert positive danger to mother or child.

#### **Management of Expulsion Stage.**

The patient should take the bed at the beginning of the second stage.

Should be dressed for the bed with her linen tucked under the arms and pinned, and with a folded sheet fastened above the hips in the manner of a skirt.

The membranes should be ruptured early in the second stage, provided there is no contra-indication.

A handy instrument for perforating the bag of waters is a coarse hair-pin straightened and previously flamed.

#### *Obstetric Positions:*

In general, consult the convenience of the patient.

For examinations, prefer the dorsal.

During the "perineal stage," the preferred position, at least for the primipara, is the lateral.

#### *Frequency of Examination:*

As infrequent as will permit a proper knowledge of the progress of labor ( $\frac{1}{2}$  to 1 hour).

#### *Anæsthetics.*

Chloroform, plain or amylied (amyl. nitrit. 1 drachm to chloroform 1 pint), the preferred anæsthetic in natural labor.

May be used in all cases for a part or all of the second stage, during the pains only.

Quantity, five to twenty drops at the beginning of each pain,—not enough to abolish consciousness, except at the perineal stage; then nearly or quite to the surgical degree.

#### **Method:**

Head low and clothing loose.

Examine the heart.

Remove false teeth.

Smear the nose and lips with vaseline or glycerine.

Inhaler, a towel spread over the head and lifted at its middle several inches from the face.



Drop the chloroform on the upper side of the towel.

Remove the towel in the intervals between the pains.

Give freely at the moment of expulsion.

*Protection of the Cervix.*

Avoid much manipulation of the cervix. It invites sepsis.

Regulate the expelling forces in over-rapid labor to prevent tears.

Regulation of the expelling forces.

Mainly by regulating the abdominal pressure.

Chloroform may accelerate, retard or arrest expulsion according to the freedom of dosage.

*Protection of the Perineum.*

Retard the expulsion of the head for a half hour or more, keeping the pelvic floor continuously on the stretch by preventing the recession of the head in the intervals between the pains. Retard by holding the head back and by regulating the driving forces with chloroform.

Deliver the head by its smallest circumference. Regulate extension.

Press the head well up in the subpubic arch as the forehead is about to escape.

Preliminary relaxation of the pelvic floor by the finger is sometimes permissible.

*Episiotomy.*

When extensive laceration is otherwise inevitable, incise the resisting ring at the vulvar outlet, bilaterally.

Cut during a pain.

Pass a narrow blunt-pointed bistoury flatwise between the head and the resisting girdle.

Turn the edge outward and cut horizontally, avoiding the skin.

Location of incisions, 1 inch from the median line posteriorly, when the parts are fully stretched.

Length of incision  $\frac{3}{4}$  inch.

Depth of incision  $\frac{1}{4}$  inch.

Suture the incisions after labor.

Management of the Cord. If wound about the neck, slip it down over the head. If this is impracticable, cut it and deliver the trunk promptly.

Delivery of the Trunk. Deliver the posterior shoulder first by lifting it over the perineum.

Extract the trunk slowly or leave to nature.

*Ligation of the Cord.* In general, wait till notable pulsation ceases at a distance of 6 inches from the umbilicus.

Tie firmly with aseptic narrow linen bobbin,  $1\frac{1}{2}$  inches from the umbilicus.

Place a second ligature a few inches farther away.

Cut between the ligatures, near the first, with clean scissors.

Thick cords should be stripped before tying.

#### **Management of the Placental Stage.**

From the moment the head is born, keep the hand on the abdomen over the anterior surface of the uterus till evacuation and retraction are complete.

Use only enough gentle friction to provoke normal contractions.

#### *Crèdè's Method.*

After three or four pains supplement the contraction, at the acme only, by manual compression, through the abdominal wall, the hand grasping the fundus, thumb in front, fingers behind.

Repeat this manipulation with each pain.

Don't pull the cord to assist delivery.

Crèdè failing after an hour, deliver by hand in vagina.

On expulsion of the placenta twist the membranes into a rope till detached.

Examine the Placenta and Membranes to make sure they are complete.

Examine the Perineum and the whole vulvo-vaginal orifice for lacerations,

*Repair of Perineal Injuries.*

Notable lacerations of the vagina or its orifice should be immediately sutured.

The perineal suture should reunite all the sun-dered structures of the perineal body.

Partial ruptures may be sutured on the mucous or skin surface or both.

Complete ruptures on the rectal, the vaginal and the skin surfaces.

Whether from the vaginal or skin surface, all deep sutures should compass a large mass of tissues on either side of the tear so that their loops when tied shall be nearly circular.

Sweep the needle deeply through one lip of the wound, carry it across just above the bottom of the tear, and pass it deeply through the other lip.

The ends of the torn sphincter ani should be brought together with two or three special sutures.

Sterilized and waxed silk sutures best answer the purpose; aseptic catgut may be used for buried sutures.

*Watch the Uterus* for half to one hour, using gentle friction if required.

*Instruct the Nurse* to bathe, with the mercuric iodide or chloride solution, the external genitals and soiled portions of the patient's body, and to change her linen and bed linen if soiled.

*The Lochial Guard* must be aseptic, still better antiseptic.

*The Abdominal Binder* (of unbleached muslin) should reach from the ensiform to a point below the trochanter; may be moderately tight for the first 12 hours, subsequently looser.

*Child's Bath.*

The face should be washed on birth of the head; the eyes should be cleansed with the mercurial solution and well dried, as a prophylactic against ophthalmia neonatorum.

Smearing the body with sweet-oil or vaseline facilitates the removal of the vernix caseosa.

During the bath all but the face should be kept submerged in water at 95° F.

Feeble infants should not be bathed for several hours or days. Rub daily with sweet-oil or vaseline instead.

Carefully avoid chilling.

*Envelope the Umbilical Stump* in salicylated cotton, and hold the dressing in place by a loose belly-band.

*The Condition of the Mother*, including the pulse-rate and amount of flow, should be noted before leaving.

*Instruct the Nurse* with reference to sleep, diet, evacuation of the bladder, nursing the child, etc.

## PUERPERIUM.

### Puerperal State.

#### Elements of Septic Danger :

Obstetric wounds of the

Uterine cavity,

Cervix,

Vagina,

Vulva,—avenues for septic absorption;

Contusions,—diminished resisting power of the tissues;

Dead animal fluids,—supplying the soil for the growth and multiplication of micro-organisms;

Enlarged lymphatics and veins,—channels for diffusion;

Resorption activity of the utero-vaginal tract;

Exhaustion of the patient,—lowering the resisting power.

#### Clinical Course and Phenomena.

Post-partum rigor.

Pulse-rate diminished (40 to 64),

Temperature.

The physiological upper limit, first four or five days,  $99\frac{1}{2}^{\circ}$ ; later,  $99^{\circ}$ , F.

Constipation.

Retention of urine (ischuria), from lowered intra-abdominal pressure and other causes.

Glycosuria from resorption of lactose,—for the first few days.

#### *Condition of the Uterus.*

Upper segment, thick and firmly retracted;

Lower segment, thin and flaccid for about 12 hours; thereafter gradually regains its shape and muscular tone.

Cavity:

Inner layer of the decidua remains to be gradually shed during the lochial flow;

Fragments of the outer,—superficial,—layer are also retained to be detached and discharged with the lochia;

Placental site prominent and studded with small blood clots.

### *Involution.*

Definition: The retrograde changes by which the hypertrophied structures, especially of the uterus, are restored to the non-gravid condition normal to the healthy parous woman.

It comprises fatty degeneration, absorption and also, to a certain extent, reconstruction.

The endometrium is completely renewed.

### *Uterus; Rate of Progress:*

#### Size:

At the close of labor, 4 or 5 by 7 or 8 inches;

Walls, 1 to  $1\frac{1}{2}$  inches thick;

Depth of the cavity, 6 inches, about.

After complete involution, the thickness, width and length are respectively 1, 2 and 3 inches.

Remains permanently larger than the virgin uterus.

#### Situation of the Fundus:

Immediately after labor, midway between the umbilicus and the pubes. A few hours later, near the umbilicus.

Tenth day, at the level of the brim.

The situation of the uterus is modified by the fulness of the bladder and rectum. It is usually dextro-verted and anteфлекed.

#### Weight:

Approximate weight at close of labor, 30 ounces.

Approximate weight end 1st week, 20 ounces.

Approximate weight end 2nd week, 10 ounces.

Approximate weight end 3rd week, 5 ounces.

After involution, 10 to 13 drachms,— $1\frac{1}{2}$  ounces nearly.

#### Duration of Involution:

Six to eight weeks or more;

Longer in non-nursing women, after twin births, premature labor, much hemorrhage, retention of secundines, than in other cases.

*Cervix:*

Expanded and flaccid below the contraction ring for 12 hours, and  $2\frac{3}{4}$  inches long;

Cervix then gradually re-formed.

Os internum then admits two fingers.

Os externum admits one finger after 7 to 14 days.

Involution goes on pari passu with that of the upper segment of the uterus.

Lower border permanently more or less notched in parous women.

*Vagina:* Walls hypertrophied and relaxed after labor;

Involution progresses with that of the uterus;

Restoration is not complete.

*Uterine Ligaments* also undergo involution.

*After-Pains:* The periodical uterine contractions of pregnancy and labor continue for a few hours or days post-partum;

Frequently more or less painful in multiparæ;

Usually not so in primiparæ;

They accomplish and maintain retraction of the uterus.

*Lochia:* The genital discharge following labor.

Character:

More or less bloody for about 4 or 5 days,—lochia rubra; containing shreds of decidua, membranes and placental tissue;

Then sero-sanguinolent,—lochia serosa,—for 2 or 3 days;

Finally creamy,—lochia alba,—and containing fat granules, epithelial cells, leucocytes and cholesterine.

Reaction alkaline for a week or more, then neutral or acid.

Amount: Total amount, about  $3\frac{1}{4}$  lbs.

Duration: Two to four weeks.

**Management of the Puerperal State.****Frequency and Number of Visits :**

- Once or twice daily for the first three days;
- Once daily thereafter till the seventh;
- Occasional visits during the balance of the month.

*Observations at the First Visit:*

- Have all instructions been observed ?
- General condition of the mother;
- Pulse and temperature;
- Sleep;
- Diet;
- Micturition;
- Lochia;
- Examination of the uterus for size, firmness, tenderness;
- Condition of the child;
- Has it passed water?
- Have the bowels moved?
- Temperature, per rectum.

*At Subsequent Visits:*

- Pulse and temperature;
- Abdominal examination of the uterus and appendages at each visit;
- Condition of the breasts and nipples;
- Examination of the pelvic organs, per vaginam, once or more during the third or fourth week. The case should not be wholly dismissed till involution is complete, and the pelvic organs are restored to their normal non-gravid state.
- Condition of the child at each visit.

**Duration of the Lying-in Period.**

- First week, in bed.
- Second week, recumbent posture on the bed or lounge; may sit erect in bed for evacuation of the bladder or bowels, and during meals.
- Third week, the chair all or part of the day.
- Fourth week, may have the liberty of the room.
- May leave the room at the end of the month.



**General Regimen.**

The bladder should be evacuated once in six or eight hours.

The bowels should be opened by a warm enema on the third day, once daily thereafter.

Water 1 pint, or clear glycerine 1 or 2 drachms, may be used for the enema.

Promote rest and sleep; they are important restoratives.

After-pains may be relieved, if necessary, by phenacetin, gr. v hourly till two or three doses are given, or by opium, gr.  $\frac{1}{2}$  to gr. 1.

Involution of the uterus, if tardy, may be promoted by gentle friction, hand on the abdomen;—galvanism, ten to twenty milliamperes, one electrode over upper part of sacrum, one upon the abdomen over the uterus,—sitting ten minutes twice daily;—Faradism in like manner;—ext. ergot, g. 1, t. i. d.; hot douche, —two or three gallons,—temp. 115° F., once or twice daily.

**Antiseptic Measures.**

Rigid cleanliness is of first importance.

Avoidance of infection is better than disinfection.

The lochial guard should be aseptic and must be frequently changed,—every three to six hours.

The external genitals should be cleansed with an antiseptic solution on changing the dressing.

Vaginal or uterine douche only for cause.

Permit no fetor.

**Use of Catheter**, when unavoidable, should conform to the following rules:

Instrument, soft rubber.

Precautions: Instrument and approaches must be aseptic. Boil the catheter for 15 minutes immediately before using.

Method: Let the patient or an assistant retract the labia, fully exposing the meatus to view.

Carefully cleanse the approaches.

Introduce the catheter  $1\frac{1}{2}$  to 2 inches.  
Repeat every eight hours.

**Dietetics.** A light diet, chiefly liquid, for the first day or more till the patient has rallied from the exhaustion of labor and the effects of the anæsthetic; *e.g.*, milk, beef juice, gruels, dropped eggs, dry toast and weak tea.

A fairly liberal diet after the first one or two days.

#### **Lactation and Nursing.**

The true milk secretion generally begins on the third day in primiparæ, the second in multiparæ.

Colostrum is the thin, somewhat viscid fluid furnished by the mammary glands of the puerpera before the true milk secretion is established. It contains fat globules and has moderate laxative properties.

**Contra-Indications to Suckling the Infant.**—Among the conditions which prohibit nursing are recent syphilis, phthisis, poor quality or very deficient quantity of milk, pregnancy.

#### *Signs of Deficient Lactation.*

Flabby breasts;

Child not satisfied and showing signs of inanition.

Weigh it weekly.

**Treatment.** Generous diet, milk, tonics and good hygiene.

#### *Nursing.*

Put the child to the breast once in four hours till the milk secretion is established, then once in two hours.

Gradually increase the interval to three hours by the end of the third month.

Double one interval in the night.

Regularity of intervals is imperative.

#### *Care of Breasts and Nipples.*

Avoid maceration of the nipples by excessive nursing.

Cleanse the nipples after each nursing, best with a weak antiseptic solution,—*e. g.*, a saturated solution of salicylic acid in water.

Gentle massage is permissible in case of simple milk engorgement.

#### *Weaning.*

The child should be weaned, as a rule, when it has eight teeth—usually about the twelfth month;—not, however, during the summer months.

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### THE CHILD.

#### Condition at Birth.

Weight.—7 to 7¼ pounds; males averaging more than females,—first, less than subsequent births.

##### Measurements:

Length, 18 to 20 inches.

Other measurements, see pages 71, 72.

##### Skin:

More or less thickly covered with vernix caseosa, which consists of fatty matter, epidermic cells and sebaceous material.

Epidermic layer exfoliates in first few days, leaving the skin red and irritable.

##### Meconium:

Consists of intestinal secretions and bile together with lanugo and epidermic scales derived from swallowed liquor amnii.

##### Circulation:

The ductus arteriosus, ductus venosus, and the umbilical veins become obliterated in a few days, the foramen ovale generally closing within a few weeks.

Pulse-rate, 120 to 140.

##### Respiration:

The lungs are collapsed and the entire respiratory tract is devoid of air till the first respiratory effort.

The air tract may contain vaginal blood and mucus from premature efforts at inspiration.

The first respiratory movement is due chiefly to the reflex effect of exposing the moist surface of the body to the air.

#### Genito-Urinary Organs:

The bladder generally contains urine.

The testicles have both descended into the scrotum.

The preputial orifice is too small to permit retraction of the prepuce over the glans during infancy.

#### Special Senses:

Sensibility of the skin is feeble at birth, fully established during the first one or two days.

Taste;—sensitive to strong tastes only.

Sound;—the child is deaf at birth, since the outer ear is closed and the middle ear is devoid of air. Loud sounds are audible within a few hours, or one or two days.

Sight;—the eye is sensitive to light.

### Management.

#### Respiration.

To expand the lungs, provoke deep inspirations by blowing upon the face, by dashing a few drops of cold water upon the chest, or by flagellation.

#### Treatment of Apnœa.

##### *Direct Insufflation:*

Child upon its back.

Partial extension of the head by a fold of blanket under the neck.

Cleanse the face and cover with a clean towel.

Prevent inflation of the stomach by pressure of the hand upon the epigastrium.

With the intervention of the towel, expand the lungs gently by mouth-to-mouth insufflation.

Repeat twenty times per minute.

##### *Sylvester's Method:*

Child supine.

Draw the arms well above the head for inspiration;

Place them by the sides and compress the thorax for expiration;

*Schultze's Method:*

Suspend the child by the shoulders, face from the operator, feet down, placing the thumb in front and fingers over the posterior aspect of the shoulders with the index fingers hooked in the axillæ,—inspiration.

Relax the pressure of the thumb to assist inspiration.

Invert the position by swinging the trunk and lower limbs upward and toward the face of the operator, flexing the trunk in the lumbar region,—expiration.

*Byrd's Method:*

Hold the child supine upon the two hands of the operator, at right angles to the fore-arms.

Tilt the hands by lowering their radial borders,—inspiration.

Tilt the hands by raising the radial borders,—expiration.

*Faradism of the Phrenic Nerve:*

Place one pole of a Faradic battery over the phrenic nerve near the sterno-cleido mastoid muscle.

Place the other pole momentarily over the region of the diaphragm, or indifferently, repeating the application at intervals of a few seconds.

Avoid over-stimulation.

*Auxiliary Measures:*

Remove the mucus from the throat with the finger and a wet soft linen, or by aspiration with a soft rubber catheter.

If the child is pale and collapsed, give a rectal injection of water at 105° to 110° F.

Maintain bodily warmth by immersion in water at 95° F.

Artificial heat is generally required to maintain the normal bodily temperature, especially in case of feeble infants. An incubator best answers the purpose when heat must be supplied for many days or weeks.

**Bathing.** Should be practised by immersion in water at 95° F.

Repeat daily, oftener for parts soiled by discharges.

Should be postponed several hours or days in case of puny children. Rubbing daily with sweet-oil or vaseline may be substituted.

**Navel Dressing.** Dress the stump of the navel cord with absorbent cotton impregnated with salicylic acid or oxide of zinc;—turn to the left side, and retain by a loose abdominal binder.

**Nursing.** Apply the child to the breast after the mother has recovered from the shock of labor.

Repeat every four hours till the secretion of milk is established, then once in two hours. Double one interval at night.

Lengthen the intervals to three hours by the age of three months.

Usually one or more artificial feedings daily will be required after the seventh or eighth month.

The child should be weaned, as a rule, after cutting eight teeth, except when that period falls in the hot months.

**Wet-Nursing.** Best substitute for maternal nursing.

Choice of nurse:

Should be of mature age, below thirty-five.

Multipara preferred.

Her child ought to be of the same age as that to be nursed within one or two months.

A menstruating woman is generally unsuitable,—a pregnant one always.

Sound health is indispensable.

Examine especially for phthisis, syphilis and all contagious diseases.

Examine the nurse's child to learn whether it has been well nourished.

The breasts should be well developed, with prominent veins and well-formed and healthy nipples.

**Artificial Feeding.****First Six Months.***Milk Mixture.\**

Cow's milk,—mixed dairy milk,	10 ounces.
Water, previously boiled,	5 “
Milk sugar,	5 drachms.
Common salt,	8 grains.†
Lime-water,—just before feeding,—	1 ounce.
Mix.	

*Meigs' Mixture. ‡*

Cow's milk,—mixed dairy milk,	2 ounces. §
Cream, containing 20% of fat,	3 “
Water, previously boiled,	10 “
Milk sugar (recrystallized and perfectly pure), $6\frac{3}{4}$	drachms.
Lime-water,—just before feeding,—	1 ounce.
Mix.	

Either of these mixtures should be prepared, bottled and sterilized soon after the milk is delivered.

*Sterilize as Follows:* Fill ten clean bottles¶ to the shoulders, each holding enough for one feeding.

Plug the mouths with rubber stoppers. They may be had, specially made for the purpose, at the druggists'. Place them loosely in the necks of the bottles for the first ten minutes of the boiling, then push them in firmly and continue the boiling for ten minutes longer.

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\* This for a child one month old.

During the first two or three weeks the strength may be equal parts of milk and water or even weaker. After the eighth or tenth month the strength may be gradually increased to whole milk at the twelfth. If hard curds are vomited or passed undigested in the stools, increase the proportion of water.

† Have powders, each containing 5 drachms of milk sugar and eight grains of salt prepared by your druggist, or use for the sugar a measure made to hold one drachm, and add salt to taste.

‡ As modified by Rotch. Closely resembles human milk.

§ Use a measuring glass to be had at the drug stores.

|| Best, that obtained by the centrifugal machine, since it may be had fresh.

¶ Or as many as the number of daily feedings.

Stand the bottles in a kettle and cover to the shoulders with cold water. Boil twenty minutes.\*

Keep on ice in hot weather.

*Feeding:* Warm the bottle to 100° F. before feeding, then remove the stopper, add half a teaspoonful of lime-water for each ounce of the prepared milk,† and slip a clean rubber nipple over the neck of the bottle.

Let the child nurse directly from the sterilizing bottle.

Cleanse the nipple inside and out after each feeding, and the bottle in like manner.

Boil the nipple for ten minutes before using, and the bottles before refilling.

*Amount and Frequency: Rules for General Guidance.*

AGE.	INTERVALS OF FEEDING. †	AMOUNT AT EACH FEEDING. §	NUMBER OF DAILY FEEDINGS.	AVERAGE DAILY AMOUNT.
First day.	2 hours.	1 drachm.	10	10 drachms.
Second day.	2 hours.	$\frac{1}{2}$ ounce.	10	5 ounces.
Third day.	2 hours.	1 ounce.	10	10 ounces.
Second week.	2 hours.	2 ounces.	10	20 ounces.
Six weeks.	$2\frac{1}{2}$ hours.	3 ounces.	8	24 ounces.
Three months.	3 hours.	5 ounces.	6	30 ounces.
Six months.	3 hours.	8 ounces.	6	40 ounces.

Small and feeble children require to be fed more frequently and in smaller quantities, large and robust children less frequently and in larger quantities than the foregoing table prescribes. The daily allowance required must be determined for the individual case by trial.

\* Or, better, steam the bottles for thirty minutes, in a steam sterilizing apparatus to be obtained at the drug stores.

Cow's milk, to be had in its best state, must be sterilized at the dairy immediately after milking, and served in the sterilizing cans or bottles.

† The addition of lime-water (or of baking soda, half a grain to each ounce of prepared milk) is essential, since cow's milk is acid, human milk alkaline.

‡ Double one interval in the night.

§ By measuring glass.



Take the child's weight once a week as a guide to the feeding. A well nourished child gains about 5 ounces weekly during the first five months.

*Peptonized Milk:* Sometimes useful as a temporary expedient when simple sterilizing fails.

Peptonize the contents of each bottle immediately before feeding, as follows: For each ounce of the sterilized mixture add extract of pancreas (Fairchild's), one-ninth grain, bicarbonate of sodium, one-third grain, and shake till dissolved. Stand the bottle in water at the temperature of 105° F. for fifteen minutes. If the milk becomes too bitter, reduce the time to ten or even five minutes.

**Six to Twelve Months.** Once in 3 to 3½ hours; 5 or 6 feedings daily.

Some farinaceous material may, in most cases, be added to the food, as follows:

*Bread Jelly:* Soak four ounces of stale wheat meal (Graham) bread in cold water for six or eight hours. Then squeeze the water out of it. Boil the pulp for one and a half hours in enough fresh water to make a thick gruel. Rub through a fine sieve and allow to stand. Mix, while fresh, one part of the jelly thus formed with eight of the milk or cream mixture before sterilizing.

*Barley or Oatmeal Gruel:* Boil for at least half an hour a tablespoonful of barley or oatmeal in one pint of water. Occasionally add water to maintain the original pint. Strain and add salt to taste. Make fresh daily. Combine with the milk or cream mixture, in the proportion of one part of the gruel to four of the mixture, before sterilizing.

Barley gruel is better if there be looseness of the bowels, oatmeal in case of constipation.

Undiluted cow's milk mixed, in the proportions given, with any of the above-named farinaceous preparations is frequently well borne by healthy children after nine or ten months. The quantity of food required will be less in proportion as the strength is increased.

**Twelve to Eighteen Months.** Four or five feedings daily.

Whole milk, sterilized, with barley or oatmeal gruel or bread jelly in the proportions above given.

Two or three ounces of raw beef juice, moderately seasoned, may be given daily, either mixed with the milk or separately. It should be prepared at least twice a day.

The simpler kinds of food requiring mastication may be added after the child has sixteen teeth,—such as oatmeal and milk, or wheaten grits,—well cooked,—or stale bread and milk.

Scraped beef or soft-boiled eggs may be allowed two or three times weekly.

**Eighteen Months to Two Years.** Four or five feedings daily.

If the child is hearty, a little fine cut meat may be given with the midday meal, such as tender beef, lamb or chicken. This, however, is not essential.

Milk should be the basis of the feeding till the child has all its teeth, and may constitute a part of it for several years longer. Milk, beef juice and the farinaceous preparations above mentioned afford a sufficient dietary for the entire period of infancy.

Proprietary foods for infants are not to be recommended.\*

### **Disorders of the New-Born Infant.—Treatment.**

Constipation. Manna gr. xx; phosphate of sodium, gr. xx; podophyllin, gr.  $\frac{3}{4}$ , in aq. anis.; glycerine or soap suppository; warm water enema, 1½ ounces.

Icterus Neonatorum. The icterode hue of the new-born is usually not true jaundice. It is generally due to changes in the blood incident to lack of nutriment during the first few days, and disappears within a week.

True icterus may occur from hepatic injuries or other causes.

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\* For further suggestions in the matter of infant dietary, see Hygiene of the Nursery, Louis M. Starr, M. D.

Intestinal Colic. Chloral 1 gr. in Aq. 1 drachm, once to three times daily, p. r. n.

Umbilical Hemorrhage. In bad cases, transfix umbilicus with a hare-lip pin and apply figure-of-eight ligature.

Frequently depends on obstructive causes and blood changes that make treatment futile.

Intertrigo. Oxide of zinc and lycopodium, equal parts, dusted upon the parts, p. r. n.

Thrush. For destruction of the parasite, use locally a solution of sulphite of sodium, drachm to the ounce, or peroxide of hydrogen, every 2 hours till the patches disappear.

For the stomatitis which remains after the destruction of the patches, a half-saturated solution of potassic chlorate used every 2 hours as a mouth-wash.

Ophthalmia Neonatorum.

Prophylaxis. Thoroughly cleanse the eyes on birth of the head, apply one of the mercurial solutions for a few minutes, and dry carefully.

The instillation of an aqueous solution of argent. nitrat., 10 grains to the ounce, may be used instead of the mercurial.

Curative Treatment. Cleanse thoroughly every two hours.

Apply twice daily, argent. nitrat., gr. x-xx in aq. dest. 1 ounce, immediately after cleansing.

Lubricate the edges of the lids with vaseline to prevent gumming together, and consequent retention of pus.

Cephalhæmatoma. If the tumor grows, shave the head and strap the tumor firmly.

Tumefaction of the Breasts. No treatment required.

## PATHOLOGY OF LABOR.

### ABNORMAL LABOR: ANOMALIES OF THE MECHANISM.

#### Classification of Abnormal Labor.

Anomalies of  
Powers;  
Excess;  
Deficiency;  
Passages;  
Passenger.

#### Anomalies of the Expelling Powers.

##### Excess:—Precipitate Labor.

###### *Causes:*

Violent uterine contractions;  
Diminished resistance.

###### *Dangers:*

For the most part, unimportant.  
Chiefly lacerations and post-partum hemorrhage.

###### *Treatment.*

Moderate the expelling forces by withholding the abdominal pressure, and by chloroform.

##### Deficiency:—Prolonged Labor.

###### Prolonged First Stage: Tardy Dilatation.

###### *Causes:*

1. Pains feeble,—inertia uteri,—from  
Anything that lowers the muscular or nervous  
tone.  
Full bladder or rectum;  
Emotional causes.
2. Pains cramp-like, but powerless.

- i. Primarily,—from neurotic causes.
- ii. Secondarily from
  - a. Excessive uterine distention;
  - b. Uterine obliquity;
  - c. Adhesion of membranes to the lower uterine segment;
  - d. Dry labor.

*Dangers:**Inertia Uteri:*

None if the patient can have sufficient sleep and nourishment.

*Cramp-like Pains:*

Danger of exhaustion in proportion to the severity of the pain.

Danger from pressure effects in dry labor in case of both mother and child, and from septic fluids.

Exhaustion predisposes to prolonged second stage.

*Treatment of Inertia Uteri.*

Quiniæ sulphat. gr. x;

Empty the bladder and rectum.

Remove the causes.

Faradic current from upper sacral region to posterior vaginal fornix. In the absence of danger to mother or child, leave to nature.

*Treatment of Cramp-like, but Ineffectual Pains.*

1. Opium, 1 grain,—not repeated.

Chloral, 1 drachm in three doses at intervals of 15 minutes.

2. a. Rupture the membranes.

b. Correct the malposition by posture, binder, or manual support.

c. Peel up the membranes.

d. Manual dilatation.

**Prolonged Second Stage.***Causes:*

Exhausted nerve force.

Excessive uterine retraction.

*Dangers:*

Mother,—Exhaustion, pressure effects, sepsis.

Child,—Chiefly pressure effects.

*Treatment.*

Eliminate obstructive causes.

Evacuate the bladder and rectum.

Summon the aid of the abdominal muscles.

Expressio fœtus.

Quiniæ sulphat., gr. x.

Hot fomentations to the hypogastrium, or the sacral region.

Semi-recumbent posture.

Ahlfeld's birth-stool.

Forbid ergot.

Forceps are indicated when longer delay would be dangerous to mother or child.

**Anomalies of the Passages.****I. Anomalies of the Hard Parts: Deformed Pelvis.****Mortality :**

Maternal, doubled.

Fœtal, much greater than the maternal.

**Dangers :**

Those of prolonged labor intensified;

Malpresentation and malposition more frequent;

Certain complications,

Prolapsus funis;

Rupture of the uterus;

Post-partum hemorrhage, etc.

The minor degrees of deformity are dangerous for the most part to the child only, and are generally capable of successful management by early recognition and timely interference.

**Frequency :**

The higher grades of deformity are rare.

Slight degrees of contraction are by no means so.

**General Character of the Anomaly :**

Rarely the abnormality consists in faulty inclination only.

In the majority of narrow pelvises the contraction is at the brim, and is most frequently an antero-posterior flattening.

Obstruction may arise from fractures, exostoses or bony tumors.

**Commoner Forms of Narrow Pelvis.****Flattened Pelvis.**

## a. Non-rachitic;

The commonest variety of contraction.

The conjugate rarely falls below 3 inches.

## b. Rachitic.

Contracted at the brim;

Widened at the outlet;

Ilio-spinal and ilio-cristal diameters nearly equal.

Mechanism of labor in flat pelvis.

The head passes the brim with its long (occipito-frontal) diameter in the transverse of the pelvis, and with the sagittal suture level.

**Flattened and Generally Contracted Pelvis.**

## a. Non-rachitic;—The more common of the two;

## b. Rachitic.

**Justo-Minor Pelvis : Pelvis Equabiliter Justo-Minor.**

Rarest of the commoner forms.

A generally contracted pelvis.

Relations not in all cases precisely normal.

Its size bears no relation to the size of the body.

The deformity is due to arrest of development from rachitis, scrofula or hard labor in childhood.

**Rarer Forms of Narrow Pelvis.****Funnel-Shaped Pelvis : Male Pelvis.**

Tubera ischiorum approximated.

Subpubic angle narrow.

Causes of the deformity, arrest of development of the lateral masses of the sacrum and co-operating causes.

**Kyphotic Pelvis.**

Upper end of the sacrum tilted backward.  
 Transverse diameter narrowed at the brim.  
 Somewhat funnel-shaped.  
 Pubic arch narrow.  
 Cause, kyphosis in the lumbo-sacral region.

**Nægele Oblique Pelvis: Anchylosed Obliquely Contracted Pelvis.**

Contraction in the oblique diameter from the acetabulum of the anchylosed side.

Distance from promontory to acetabulum, and from tip of sacrum to spine of the ischium, diminished on the affected side.

Walls of the pelvic cavity converge below.  
 Pubic arch narrow.

Cause of the deformity, ankylosis of one sacro-iliac joint.

**Ordinary Oblique-Ovate Pelvis.**

Shape similar to that of the Nægele.

Causes:

Lateral spinal curvature,—scoliosis.

Impeded function of one lower extremity from  
 Hip disease, or

Amputation or old dislocation of the femur on  
 the dorsum ilii.

Weight of the body thus falls on one lateral  
 half of the pelvis.

**Roberts' Pelvis.**

Anchylosed and transversely contracted pelvis.  
 Very rare.

Lineæ ilio-pectineæ approximated.

Subpubic angle narrow.

Ischial spines and tuberosities in close proximity  
 to each other, and to the margin of the sacrum.

Cause, arrested development of the sacrum and  
 sacro-iliac ankylosis of both sides.

**Spondylolisthetic Pelvis.**

Very rare.

Conjugate shortened.



Lower end of sacrum tilted forward.

Cause, gliding forward of the last lumbar on the first sacral vertebra.

#### **Osteomalacic Pelvis.**

Promontory approximates the pubes and the tip of the sacrum.

A prominence opposite each acetabulum.

Brim pointed anteriorly.

Subpubic arch nearly or quite obliterated.

Tuberosities approximated.

Anterior-superior spines of the ilia approximated.

#### **Diagnosis of Pelvic Deformity.**

##### *History:*

Rachitis, as indicated by tardy dentition, sweats, pigeon breast, curvature of tibiæ or spine, large joints;

Very low stature ;

Deformities in near relatives ;

Previous labors.

*Mensuration:* Often the only means of diagnosis.

##### Method :

Patient on a hard table, in dorsal decubitus, legs and thighs partly flexed.

Schultze's pelvimeter.

External Measurements.

Vide p. 65.

External conjugate,—7 inches average lower limit in normal pelvis.

Ilio-spinal and ilio-cristal both small indicates general contraction.

Ilio-spinal equal to or greater than the ilio-cristal, flattening.

Internal Measurements.

##### Method :

Empty the bladder and rectum.

The hand is the best pelvimeter for internal measurements.

Note

Depth of the symphysis pubis ;

Width of the subpubic angle ;  
 Size and shape of the sacrum ;  
 Bis-ischial diameter ;  
 Diagonal conjugate,—as follows :

Passing the index and second fingers into the vagina, place the outer edge of the tip of the second finger against the summit of the promontory, radial edge of the hand against the subpubic ligament ;

Measure the distance between the points of contact.

Find true conjugate by deducting one-half to three-quarters of an inch, according to the depth and inclination of the symphysis pubis, from length of the diagonal.

Note the other diameters at the brim,—hand in the vagina.

### **Management of Labor in Narrow Pelvis, Especially Flat Pelvis.**

Conjugate  $3\frac{1}{2}$  inches or more :

Nature. Spontaneous delivery of a living child is possible in the majority of cases.

Alternatives :

Forceps,—Tarnier ;

Version (podalic).

Conjugate  $2\frac{3}{4}$  to  $3\frac{1}{2}$  inches :

Premature labor ;

Version (podalic) ;

Craniotomy or Version, if child is dead.

Conjugate  $2\frac{1}{2}$  to  $2\frac{3}{4}$  inches :

Cæsarean section if all conditions are favorable and the mother so elects. Otherwise,

Craniotomy.

Conjugate  $2\frac{1}{2}$  inches or less :

Cæsarean section, or in certain cases, the

Porro operation. See " Porro Operation."

### **II. Anomalies of the Soft Parts.**

**Atresias :**

*Pudendal :*

Inflammatory adhesions of the labia majora.

Œdema vulvæ.

Thrombus.

Cancer.

Simple rigidity.

Rigid hymen.

*Treatment.*

Thrombus ;—Rarely requires incision, evacuation of the clots and styptic packing.

Rigid Hymen ;—Single or multiple incisions.

Other Forms of Rigidity.

Forceps.

Episiotomy, when delivery without notable laceration is otherwise impossible.

*Vaginal:*

Congenital :

Annular stricture.

Narrowness throughout.

Acquired (inflammatory).

*Treatment.*

Scissors ;

Forceps ;

Cæsarean section.

Cystocele.

*Treatment.*

Catheterize and replace.

The use of the catheter being impossible, aspirate.

Rectocele.

*Treatment:*—Replace.

*Rigidity of the Cervix:*

Atrophic changes in aged primiparæ.

Hypertrophy of the portio vaginalis.

Cicatricial tissue.

*Treatment.*

Manual dilation.

Multiple incisions, rarely.

*Cancer of the Cervix.**Treatment.*

- Manual dilatation.
- Removal of the cancer during pregnancy.
- Premature labor.
- Cervical incisions through the healthy tissues by thermo-cautery.
- Forceps.
- Cæsarean section, in rare cases.

*Occlusion of the Os Externum.*

*Treatment.* Reopen the os by incision from behind forward.

*Tumors:*

- Vesical calculi.
- Vaginal tumors.
- Uterine polypi.

*Treatment.*

- Replace vesical calculus.
- Replacement impossible, remove the calculus by vaginal lithotomy.
- Push the tumor above the head, with the aid of the genu-pectoral position.
- Remove, if pedunculated, with the écraseur.
- Aspiration of ovarian cysts if reposition fails.
- Ovariectomy during pregnancy.
- Cæsarean section.

**Anomalies of the Passenger.****Occipito-Posterior Positions.**

*Frequency*, 20% of vertex births.

*Mechanism.*

- i. Forward rotation of the occiput,
  - Above the brim,
  - In the cavity,
  - At the vaginal outlet.
- ii. Forward rotation of the sinciput.

*Dangers* in persistent occipito-posterior positions:  
To the Mother ;—

Exhaustion,  
 Laceration of the perineum.  
 To the Child ;—  
 Those of prolonged second stage.

*Diagnosis.*

Abdominal examination. Vide p. 78.

Vaginal examination. Vide p. 81.

Large fontanelle easily accessible indicates either an occipito-posterior position or an imperfectly flexed anterior position.

*Treatment.*

Above the Brim :—Rotate by combined internal and external manipulation.

In the Cavity :

Promote extreme flexion by pressure against the forehead ;

Assist rotation, cautiously ;

Forceps,—Tarnier,—only after delay becomes dangerous to mother or child.

At the Vaginal Outlet :—Rotate by backward pressure with the fingers on the anterior temple, combined if necessary with forward pressure upon the occiput.

**Face Presentation.**

*Frequency*, 1-250.

*Cause.*

Extension of the head at the beginning of labor due to

Narrow pelvis ;

Brim narrowed by prolapsed extremity ;

Undue projection of the ischial spines ;

Impaction of the occiput in occipito-posterior positions ;

Excessive obliquity of the uterus ;

Mobility of the fœtus from small size, or from excess of liquor amnii ;

Shape of the head,—long occipital pole (dolichocephalus) ;

Congenital enlargement of the thyroid ;

Increased size of the chest or neck ;

Cord about the head.

The extension is most frequently due to a combination of causes.

Very rarely is primary.

The preponderance of left mento-anterior positions is due to the right obliquity of the uterus.

### *Mechanism.*

The head descends with its occipito-mental diameter in relation with the axis of the birth-canal, but with that diameter inverted,—mental pole first.

The engaging plane is the trachelo-bregmatic, 3 by  $3\frac{1}{2}$  inches or little more.

The difficulty of face birth is due to the fact that the thickness of the neck and a portion of the chest is added to the long diameter of the face as the face descends, making a total diameter of  $6\frac{1}{2}$  inches.

#### Positions :

Left mento-anterior,—L. M. A.

Right mento-anterior,—R. M. A.

Right mento-posterior,—R. M. P.

Left mento-posterior,—L. M. P.

### *Mechanism of Mento-Anterior Positions.*

#### Movements :

Extension ;—Corresponds to flexion in vertex births.

Rotation ;—Unlocks the difficulty of face birth.

Failure is more serious than in vertex presentation.

The mechanism is the same as in vertex (*mutatis mutandis*).

Flexion ;—Corresponds to extension in vertex deliveries.

The head rests by the lower surface of the inferior maxilla upon the ischio-pubic rami as a pivotal point, and is expelled by a movement of flexion,—the face, the forehead, the vertex and the occiput successively sweeping over the perineum.

External Rotation or Restitution.

*Mechanism of Mento-Posterior Positions.*

In a typical case the birth of persistent mento-posterior positions is impossible, since it would require a diameter of  $6\frac{1}{2}$  inches to pass through the pelvis.

Spontaneous rotation of the chin to the front generally occurs.

*Prognosis.*

Mortality, 6% of the mothers, 13% of the children.

Face of the child greatly disfigured.

*Dangers:*

To the mother, exhaustion.

To the child, cerebral congestion from pressure on the veins of the neck.

Rotation failing, nearly all die.

*Diagnosis.*

Abdominal examination:

Cephalic tumor very round and fills only one side of the pelvis;

Cephalic prominence in relation with the back and generally on the same side of the median line with the breech;

Sulcus at the junction of the head and back;

Heart and small parts on the same side;

Inferior maxilla accessible to palpation.

Vaginal examination:

Diagnostic marks:

Orbital ridges;

Nasal bones;

Malar bones;

Alveolar processes;

Chin.

*Treatment.*

Nature is competent in a large proportion of mento-anterior cases, but in those only.

Preserve the membranes.

At the Brim:

Convert by the method of

Schatz,—thrusting the breech forward \* with one hand, the chest backward and upward with the other, by external manipulation;

Baudelocque,—hooking the occiput down with the hand in the uterus;

Or both combined,—under chloroform if required.  
Version, especially with prolapsus funis.

In the Cavity :

Promote extension and rotation.

Forceps.

**Brow Presentation.**—Semi-extension of the head.

Persistent semi-extension is rare : partial extension is generally converted spontaneously into vertex or face.

*Positions.* As in face presentation.

*Prognosis.* Delivery in persistent brow cases is possible, only with a relatively large pelvis.

*Diagnosis.*

Abdominal Examination :—Signs of face presentation imperfectly developed.

Vaginal Examination :—Orbital ridges on one side, bregma on the other side of the presenting part.

*Treatment.*

Convert into vertex or face.

Craniotomy, in dead fœtus.

**Pelvic Presentation.**

*Varieties:*—Breech;—Knee;—Footling.

*Frequency:*—One in sixty, exclusive of premature births.

*Causes:*

Narrow pelvis ;

Uterine tumors ;

Placenta prævia ;

Hydrocephalus ;

Multiple fœtus.

Conditions favoring mobility of the fœtus, *e. g.*,

Multiparity ;

---

\*Toward the child's feet.



Prematurity ;  
 Lax uterine walls ;  
 Excess of liquor amnii ;  
 Shape of the uterus possibly ;  
 Small fœtus.

*Mechanism:*

Positions :

Left sacro-anterior,—L. S. A.  
 Right sacro-anterior,—R. S. A.  
 Right sacro-posterior,—R. S. P.  
 Left sacro-posterior,—L. S. P.  
 Rotation in breech is not so marked as in head presentation.  
 The shoulders rotate more or less perfectly.  
 The head rotates as in vertex births.  
 The posterior hip is expelled first.  
 Spontaneous expulsion of the after-coming head is exceptional.

In persistent dorso-posterior positions,

The after-coming head is generally delivered mental pole first ;  
 The chin catching upon the pelvic brim, delivery may be accomplished occiput first.

*Prognosis.*

Mother :

Risk to life not increased.  
 First stage may be more tedious.  
 Second stage frequently more rapid.  
 In artificial delivery, laceration of the cervix is more frequent than in vertex births ; laceration of the perineum is the rule.

Child :

Mortality very great without interference, one in three or four.  
 With skilled management but little greater than in vertex births.

Causes of foetal mortality :

Apnœa from

Separation of the placenta,

Compression of the placenta,

Pressure upon the funis;

Impeded blood supply from retraction of the uterus.

The danger is increased in dry labor.

### *Diagnosis.*

Abdominal examination ;—vide p. 78.

Vaginal examination.

Glove-finger protrusion of the membranes;

Absence of the hard globular head;

Tuberosities of the ischium;

Tip of the coccyx, anus, genitals, on a line bisecting the bis-ischial line at right angles;

Femora;

Expulsion of meconium (may occur in cephalic births);

Identify foot, knee, shoulder, elbow, hand, by their anatomical characters.

### *Treatment.*

Before Labor.

External version in favorable cases.

During Labor.

The danger to the child is chiefly due to the difficulty of delivering the after-coming head before the child dies of apnœa;

The delivery of the after-coming head is facilitated by

1. Full dilatation of the passages;

2. Complete flexion of the head and arms.

Promote 1 by preserving the membranes till they reach the pelvic floor ;

Accomplish 2 by avoiding traction till the trunk is delivered;—or, when traction is unavoidable, by external manipulation.

## Dorso-Anterior Positions :

Delivery of the After-coming Head.

On expulsion of the trunk.

Examine the funis for pulsation.

Pull the funis down and dispose by the sacro-iliac joint in that half of the pelvis which offers the most room.

Management of the Arms:

Arms Flexed;—Delivery is easy.

Arms Extended;

Seize the feet and draw the trunk to the side opposite the occiput;

Pass the free hand up along the dorsum and slip one or two fingers over the shoulder and along the humerus to the elbow;

Sweep the elbow across the face and down.

Change hands and reverse position of the trunk for delivery of the other arm.

Delivery of the Head:

Expressio fœtus by an assistant.

Invoke all the voluntary expelling force of the mother at the critical moment; omit anæsthetic.

Smellie-Veit Method:—Traction by two fingers hooked over the shoulders, astride the neck, maintaining extreme flexion by two fingers of the other hand pressed against the fossæ caninæ or the lower maxilla, trunk lying along the fore-arm of the operator or upon abdomen of the mother.

Wigand-Martin Method:—Maintain flexion as above and deliver by supra-pubic pressure with the other hand.

Keep the long diameter of the head in the oblique diameter of the pelvis, until past the brim.

Forceps:—Applied to head, trunk upon the abdomen of the mother.

## Dorso-Posterior Positions:

Rotate the occiput to the front after the expulsion of the body by gentle torsion of the trunk or by pressure on the anterior temple.

Rotation failing, deliver by traction downward and backward over the perineum.

The chin catching over the brim of the pelvis, deliver occiput first by traction downward and forward.  
Nuchal Arm:—Rotate the body in the direction from the misplaced arm.

Failure of the Powers at or above the brim:—Bring down one or both feet.

Impaction:—Traction by

Finger,—Fillet,—Forceps.

In dorso-anterior positions;—The finger or fillet in one groin.

In dorso-posterior positions;—Adjust a soft oiled fillet so that the loop may encircle the pelvis, the free ends depending between the thighs.

Forceps:—Apply one blade over the sacrum and ilium, the other over the posterior surface of the opposite thigh.

Indications of Danger to the Child.

Funic pulse irregular and feeble;

Convulsive movements;

Occasional gasping respiratory movements.

### Shoulder Presentation.

*Varieties:*—Shoulder, arm, hand.

*Frequency:*—1-250.

*Causes:*

Unusual mobility of the foetus from causes already enumerated;

Undue pelvic inclination;

Narrow pelvis;

Low attachment of the placenta.

*Positions:*

Left scapula-anterior;—L. S. A.

Right scapula-anterior;—R. S. A.

Right scapula-posterior;—R. S. P.

Left scapula-posterior;—L. S. P.

*Prognosis:*

1-9 of the mothers and 1-2 of the children die.

Danger to the mother,—pressure effects, exhaustion, rupture of the uterus.

Danger to the child;—Pressure, etc.

*Diagnosis:*

Abdominal Examination:

Absence of head in the excavation;

Presence of head in the iliac fossa.

Vaginal Examination:

Glove-finger protrusion of the membranes;

Absence of the hard globular head;

Absence of any presenting part at the beginning of labor;

Presenting part a small rounded prominence;

Distinguish it from the ischial tuberosity by the absence of a companion;

From it radiate the humerus, the clavicle, the spine of the scapula;

Neck on one side, ribs on the other;

Axilla;

Elbow, identified by the olecranon;

Distinguish hand from foot, right from left hand.

Diagnosis of Position:

Relation of the scapula to the brim;

Axilla or elbow, looks toward the feet;

Thumb, toward the head.

Spontaneous Delivery.

Spontaneous Version;

Spontaneous Evolution;—Expulsion with trunk doubled on itself. Possible only when disproportion between size of the pelvis and the foetus favors. Almost invariably fatal to the child.

*Treatment.*

Before Labor.

External cephalic version.

Retain by abdominal binder and lateral compresses.

**During Labor.****Ordinary Cases.**

Preserve the membranes.

Evacuate the bladder and rectum.

**Version:**

Cephalic;

Podalic;

**Methods:**

External;

Bipolar;

Internal.

**Impacted and Irreducible Cases.****Decapitation.**

By the blunt hook and scissors;

By a strong chain *écraseur*. Pass a tape and draw the chain into place.

After decapitation push up the head and deliver the trunk, then extract the head, chin-first.

**Complex Presentations.****Head and Hand.**

Replace the hand.

Forceps, placing the arm in the unoccupied side of the pelvis.

**Hand and Foot.**

Podalic version.

**Head, Hand and Foot.**

Podalic version.

**Nuchal Arm.**

Diagnosis by hand in the passages, under chloroform.

Dislodge the arm. Rotate the body from the nuchal arm.

Version.

**Anomalies of Development.****Multiple Fœtus.**

Relative situations of twins:

One beside the other;

One above the other;

One in front of the other.

*Diagnosis.*

Vide p. 44.

*Management.*

Expedite the second birth.

Forceps or version.

**Interlocking Twins.****Presentations:**

- a. Both cephalic. Both heads offering,—one impacted between the head and trunk of the other fœtus.
- b. One cephalic, one pelvic. The after-coming head of the breech birth impacted between the head and trunk of the other fœtus.

*Management.*

Disengagement by combined internal and external manipulation with the aid of the knee-chest position.

Decapitation of the first child as a last resort.

**Double Monsters.**

Premature birth and spontaneous delivery the rule.  
Embryotomy, in difficult cases.

**Hydrocephalus.**

Consists of enlargement of the cranial vault, due to serous effusion into the cranial cavity.  
The fluid may amount to several pints.  
Spina bifida may co-exist.

**Causes.**

Syphilis, cretinism and other causes.

*Diagnosis.***Head-first Cases.****Abdominal Examination.**

Obvious.

**Vaginal Examination.**

Size of the cranial vault;  
Elasticity;  
Fluctuation;  
Increased width of sutures;

Large size of the fontanelles;  
Sometimes a supplementary fontanelle between the  
anterior and posterior.

Confirm if necessary by the hand in the vagina  
under anæsthesia.

Head-last Cases;—1-5 present by the breech.

Body wasted.

Head arrested after birth of the trunk.

Abdominal examination.

*Prognosis.*

Child:

Generally fatal;

If born alive, viability feeble.

Mother:

Danger of

Exhaustion;

Rupture of the uterus.

*Treatment.*

Nature.

Forceps, or

Perforation,—according to the degree of obstruction.

Cephalotribe as a tractor.

Breech-first cases,—perforate the head, or open the  
spinal canal and catheterize the cranial cavity.

**Dropsy of other Cavities or Emphysema.**

*Treatment.*

Aspiration of the dropsical cavities, or incision.  
Embryotomy.

**Tumors.**

*Treatment.*

Fluid tumors:—tapping; incision; laparotomy.  
Solid:—segmentation; laparotomy.



## COMPLICATED LABOR.

**Prolapsus Funis.**

*Frequency*, 1-250.

*Causes:*

Anything which prevents the presenting part from completely and continuously filling the lower uterine segment;—*e. g.*,

Hydramnion;

Pelvic deformity;

Malpresentation.—Frequency in head presentation 1-304, face 1-32, pelvis 1-21, shoulder 1-12;

Complex presentations;

Low placental insertion;

Marginal insertion of the cord;

Twins;

Excessive length of cord.

*Prognosis.*

No increased risk to the mother.

No presentation more fatal to child.

Fœtal mortality 1-2.

Greatest in vertex and in first labors.

*Diagnosis.*

Before rupture of the membranes, differentiate from fingers, toes,—loop of intestine in rupture of the uterus.

Examine for the funic pulse.

Absence of pulsation for 15 minutes to be taken as evidence of death of the fœtus.

*Treatment.*

Preserve the membranes.

Maintain the latero-prone posture.

Reposition,—in genu-pectoral position.

Manual.

Twist the prolapsed loop lightly into a rope and replace anteriorly by taxis.

Detain by passing it over a knee,—or by a large aseptic sponge or a rubber bag distended with water.

Wind the cord about the trunk by rotating the trunk around its long axis.

**Instrumental.**

Reposit by means of an English catheter with a tape attached and loosely looped over the cord.

Crowd the head into the excavation after repositing the cord.

Forceps,—first placing the cord toward the sacro-iliac joint opposite the side of the head.

Version,—especially in malpresentations.

**Inversion of the Uterus.**

*Degrees and Forms:*

Depression of the fundus;

Partial inversion;

Complete inversion;

Inversion of the lower segment.

*Frequency*,—1-200,000 about.

*Etiology.*

Maladroitness pressure on the uncontracted fundus.

Traction on the cord while the uterus is relaxed.

A fundal placental seat favors.

Irregular contractions of the uterus from atony of the placental site,—the atonic portion, falling inward, is extruded downward as a foreign body.

Rarely occurs after delivery of the placenta.

*Prognosis.*

Mortality,—1-5 to 1-3, from hemorrhage and shock, or peritonitis and gangrene of uterus.

*Diagnosis.*

**Symptoms:**

Shock;

Pain;

Hemorrhage.

**Signs:**

1. Absence of the usual abdominal tumor;—

Method of examination.

Abdominal palpation.

Combine abdominal with vaginal or rectal examination.

Sound in the bladder and finger in the rectum.

Catheterize the bladder.

Exclude morbid growths.

2. Presence of a vaginal tumor;

3. Character of the tumor.

Differentiate from polypus by,

Special contractility;

Large pedicle;

Pain and immobility on attempting torsion;

Uterine sound.

Differentiation sometimes difficult.

Note that the placenta may be still adherent.

#### *Treatment.*

Preventive:—Proper management of the third stage.

Reposition.

Method.

Simple Cases,—a few hours after inversion.

Anæsthesia.

Place one hand on the abdomen over the inverted uterus.

Cone the fingers of the other hand and apply the pressure over the insertion of one Fallopian tube.

Direct the force to one side of the sacral promontory.

Placenta adherent, replace all;

Placenta partially detached, separate and remove the placenta before replacing.

Difficult Cases.

Taxis with the aid of the genu-pectoral position and Sims' speculum.

Elastic pressure by means of a water-bag, alternated with taxis.

Avoid extreme measures during the puerperium.

### **Rupture of the Uterus.**

#### *Nature of the accident.*

Generally begins in the lower segment.

May be partial or complete.

May take any direction and reach any extent within the limits of the organ.

May invade the vagina and bladder.

The portio vaginalis may be torn off.

Notable fissures of the cervix occur in nearly all labors.

Very rarely occurs during pregnancy.

*Frequency*:—1-4000.

*Causes*:

Predisposing:

Anything which impairs the integrity of the uterine muscularis;

Carcinoma;

Myoma;

Obstructed labor, leading to excessive thinning of the lower uterine segment.

Exciting:

Ergot;

Operative violence, such as

Forceps through undilated os;

Version during contraction.

Other operations.

*Prognosis*.

Mother:—Mortality, 90 to 95%.

Child:—Mortality still greater.

*Diagnosis*.

Precursory signs:

Concurrence of obstruction with violent uterine effort.

Excessive uterine retraction.—Locate retraction ring by abdominal palpation.

Signs of Rupture.

• Shock;

Hemorrhage;

Sudden cessation of contractions,—in complete rupture;

Sensation of tearing;

Recession of the head;  
 Absence of the signs of fœtal life.  
 Abdominal examination;—uterus and child present  
 separate tumors.

### *Treatment.*

#### Preventive:

Remove the cause of obstruction if possible;  
 Artificial delivery in excessive retraction of the  
 uterus.

#### Remedial:

Incomplete, — drainage with iodoform gauze, or  
 iodoform wicking;  
 Complete,—extraction through the rent and subse-  
 quent drainage of the abdominal cavity in certain  
 favorable cases of posterior rupture ; craniotomy in  
 the grasp of the forceps;  
 Laparotomy in case of  
   Child wholly in peritoneal cavity;  
   Child long dead;  
   Much hemorrhage into peritoneal cavity;  
   Cervix not dilatable;  
   Site of rupture unfavorable for drainage.  
 Cleanse the peritoneum and suture the rent.  
 Amputate the uterus if necessary to avert sepsis.

## **The Hemorrhages.**

### **Ante-Partum Hemorrhage.**

#### **I. Placenta Prævia.**

Definition;—Implantation of the placenta upon the  
 lower zone of the uterine walls.

Cause of Hemorrhage;—Separation of the lower mar-  
 gin of the placenta during canalization of the cervix.

Degrees of Placenta Prævia.

Marginal,—edge presenting;

Partial,—partially covering the fully dilated os  
 uteri;

Complete,—wholly covering the fully dilated os.

Exact central implantation is rare.

*Frequency*.—1-1000.—More frequent in multiparæ than in primiparæ.

*Causes*:

Obscure.

Possibly certain morbid conditions of uterine mucosa and consequent tardy fixation of ovum.

*Source of the Hemorrhage*. The uterus,—not the placenta.

*Prognosis*.

Mortality;—Mother  $\frac{1}{3}$ , child  $\frac{2}{3}$ .

Mortality to both mother and child varies with the degree of placenta prævia.

The maternal mortality is due to hemorrhage, shock, sepsis and thrombotic affections.

The foetal, to apnœa, hemorrhage, prematurity, operative causes.

There are practically no deaths from placenta prævia before the seventh month.

The danger increases as gestation progresses, since the vessels are larger and separation more liable to occur.

*Diagnosis*.

*Symptoms*:

Usually none in the early months.

The first indication generally is a sudden hemorrhage of greater or less severity.

The first hemorrhage occurs most frequently in the seventh or eighth month. Sometimes not till term.

Hemorrhage of any note during pregnancy demands investigation, especially in the latter months.

*Physical Signs*:

Placenta may sometimes be mapped out by abdominal palpation.

Unusual development of the cervix, especially in complete placenta prævia.

A boggy feel of the cervix and the lower segment of the uterus.

A cushiony mass between the presenting part and the examining finger.

Characteristic stringy feel of the detached surface of the placenta, examined through the cervical canal.

Distinguish from clots by less friability.

In marginal placenta prævia the edge may be felt if separated.

#### *Treatment.*

Before Viability.

In general expectant.

If the hemorrhage be copious, placenta prævia complete or the fœtus dead, empty the uterus.

After Viability.

Induction of labor,—simple cases excepted.

#### *Management of Labor.*

The principal indication is the control of hemorrhage.

Hemorrhage controlled,—wait, but remain with the patient till delivered.

Nature is competent in very rare cases by extra-rapid delivery.

Rupture the membranes in certain cases of partial placenta prævia, and apply a binder.

Forceps in certain similar cases.

Tamponade, vaginal with or without the cervical.

Method:

Sims' position and Sims' speculum.

Water-bag in the cervix.

Pack the vagina full, with sterilized cotton in small wet pledgets.

Hold by a T bandage.

Renew every six to eight hours with antiseptic precautions.

Mercurials must not be used in the tampon.

Podalic Version.

External, bipolar, or internal, pushing the placenta to one side in latter methods.

The podalic extremity of the fœtus acts as a cervical plug.

Leave expulsion to nature.

Nature failing, extract very slowly and with extreme care to avoid shock.

#### Other Methods.

Separation of the placenta from the lower uterine segment (Barnes).

This permits retraction of the zone uncovered.

The area of detachment should be not less than  $4\frac{1}{2}$  inches in diameter:

Complete separation and extraction of the placenta (Simpson).

Applicable in case

Child is dead;

Child not yet viable.

Extraction of the child by perforation of the placenta.—Rarely permissible.

#### Precautions.

Guard against shock, septic infection, post-partum hemorrhage.

Avoid too precipitate and violent interference. It is the cause of a large proportion of deaths in placenta prævia.

## II. Accidental Hemorrhage:—Hemorrhage from partial separation of a normally situated placenta.

### *Varieties.*

Apparent;

Concealed.

1. Separation central, margin adherent.
2. Separation at the margin partially lifting the membranes beyond the margin.
3. Separation the same as in 2, but blood escaping into the cavity of the ovum by rupture of the overlying membranes.
4. Separation of the margin of the placenta and of the membranes, but the lower segment of the uterus blocked by the fœtal head.

### *Causes.*

The loose attachment of the placenta normal to the last weeks of gestation;



Violent muscular exertion;  
Violent uterine contractions;  
External violence;  
Blood state,—*e. g.*, of albuminuria, anæmia;  
Placental disease.

*Prognosis.*

## Apparent Variety:

Not usually grave to the mother, frequently fatal to the child.

## Concealed Variety:

Maternal mortality 50%,—from blood loss, post-partum hemorrhage, sequelæ.

Fœtal, 90% or more.

*Diagnosis.*

Apparent Variety, obvious;

Concealed;

Uterine distention;

Violent pain in certain cases from distention of the peritoneal coat of the uterus;

Collapse and other signs of internal hemorrhage;

Bloody liquor amnii.

Concealed and slight apparent hemorrhage may co-exist.

Distinguish from rupture of the uterus which occurs later in labor; from placenta prævia by absence of the physical signs of misplaced placenta.

*Treatment*,—in either variety.

Make the uterus contract.

To that end, rupture the membranes, and apply uterine compression by means of a binder.

Cervical and vaginal tampon with caution if at all.

Artificial extraction after full dilatation.

Version.

**Post-Partum Hemorrhage.**

Rare in well managed labors.

The normal blood loss at the close of labor varies from two or three ounces to a pint.

*Etiology.*

1. Failure of retraction due to  
     Inertia uteri, from relaxed habit of body, exhaustion, mismanaged third stage, excess of chloroform;  
     Atony of the placental site;  
     Neoplasms;
2. Blood state,—as in hæmophilia, chronic nephritis.

*Diagnosis.*

Symptoms:—Premonitory:

History of hemorrhage in previous labors.  
 Pulse at or above 100;  
 Imperfect retraction;  
 Presence of other causes of hemorrhage.

Signs:

A sudden outburst of blood;  
 No uterine globe;  
 Systemic effects of severe hemorrhage, viz.:  
     Pallor;  
     Surface cold, clammy, especially the extremities;  
     Perspiration;  
     Respiration irregular, sighing, sobbing, yawning;  
     Pulse rapid, thready, compressible;  
     Thirst;  
     Jactitation;  
     Tinnitus aurium;  
     Sense of apnœa;  
     Nausea;  
     Dimness of vision;  
     Syncope.

Absence of visible flooding does not forbid the diagnosis of hemorrhage.

A flow of blood with firm uterine contraction does not come from the uterine cavity. Examine for cervical or vaginal lacerations.

A thin thread-like stream of bloody serum indicates a clot in the uterus.

Treatment.

Nature's hæmostatics:

Retraction of the arteries;

Valve-like action of the veins owing to their obliquity;

Uterine retraction;

Thrombosis.

Prophylactic:

Ligation of vessels by firm and persistent retraction.

In order to this

Compel the uterus to expel the child;

Compel the uterus to expel the placenta;

Keep the hand over the uterus till the third stage is completed;

Ergot hypodermically in the presence of the recognized causes of hemorrhage,—at beginning of third stage.

Remedial:

Simple cases:

Manipulation, by one or both hands over the abdomen;

Ergot (hypodermically), fluid extract, one-half to one ounce;

Hot douche, intra-uterine, at a temperature of 110° to 120° F.

Severe cases:

Hand in uterus raking the cavity vigorously with the finger tips;

Hot douche, temp. 115° to 125° F.;

Styptics (rarely), applied with a swab, such as tincture of iodine, spirits of turpentine, lactic acid, acetic acid (or common vinegar), creolin, chloroform, most of which also act to excite uterine contractions.

Other measures:

Child to the breast as a reflex excito-motor;

Compression of the aorta, very effectual as a temporary expedient;

Faradism of the uterus;

One pole within the uterus and one over the

abdomen or upper sacral region;

Poles both over the abdomen, one on either side of the uterus;

Curette;

Tampon the uterus with sterilized gauze.

### Secondary Hemorrhage.

Definition.—A hemorrhage occurring within the post-partum month later than six hours after labor.

*Treatment.*—Curette the uterine cavity.

*Treatment of Acute Anæmia.*

Elevate the hips and lower the head.

Bandage the extremities.

Opium in full doses, 2 gr., p. r. n.

Rectal injections of a warm .73% solution of common salt, or of nutrient fluids.

Hypodermic injections of a sterilized .73% salt solution, 8 to 32 ounces,—aseptically.

Hypodermic injections of brandy or ether, digitalis, strychnia.

Infusion of the sterilized salt solution into a vein.

Transfusion.

For the thirst, a saline drink,—*e. g.*, a solution of ammon. acetat.

## OBSTETRIC SURGERY.

### Induction of Premature Labor.

#### *Indications:*

Certain cases of narrow pelvis;  
Certain cases of albuminuria of pregnancy;  
Placenta prævia after viability of the fœtus;  
Certain cases of hydramnion;  
Habitual death of the fœtus in the last month of gestation, and some others.

*Time:* 32nd to 36th or 38th week, according to the relative size of the head and pelvis.

#### *Method:*

First Step;—Hot antiseptic douche against the membranes for twenty minutes.

Second Step;—Separation of the membranes from the lower segment by means of a uterine sound.

Third Step;—Insertion of an English bougie between the membranes and the uterus.

Other Methods:

Either of the above measures alone.

Galvanism or Faradism of the uterus,—mild currents.

#### *Care of the Child.*

Maintain the bodily warmth by the aid of artificial heat.

Gavage, or feeding through a soft stomach tube in very feeble children.

### Forceps.

#### *The Instrument.*

Parts, etc.

Right and left arms,

Handles, shanks, blades, lock,

Pelvic and cranial curves.

*Principal Pattern.*

Marked pelvic curve;—type, Davis'.

Moderate pelvic curve;—type, Simpson's.

Axis-traction forceps;—Tarnier and its modifications.

*Care of the Instrument.*

Always boil it for half an hour after using, or heat to 234 deg. F.

Sterilize before using.

Keep free from rust and well polished.

Occasionally renew the nickel-plating.

*Mechanics of Forceps Delivery.*

As a Lever. Use as a lever to be condemned.

Oscillating motion of forceps during extraction a mechanical gain but dangerous to the maternal soft parts.

As a Compressor. Use as a compressor permissible in case of seizure over the frontal and occipital bones only, since compensation takes place mainly by the elevation of the parietals, elongating the occipito-mental diameter.

No gain as a rule in other seizures since, the parietals being included in the grasp of the instrument, compensation elongates a transverse diameter.

Safe limit of compression, about one-half inch.

As a Tractor. The principal use of forceps.

*Indications for Forceps:*

Forces at Fault:—Cases of cephalic presentation in which nature is clearly incompetent to deliver with safety to mother and child.

Passages at Fault:—Certain cases of obstruction in the bony pelvis or in the soft parts.

Child at Fault:—Certain cases of foetal dystocia,—*e. g.*, occipito-posterior positions, face presentations, hydrocephalus, after-coming head, impacted breech, and others.

Complicated Labor:—Certain cases of placenta prævia, prolapsus funis, rupture of the uterus and of eclampsia.

*Dangers of the Forceps Operation:*

To the mother:

Low operation;

Practically none;

Danger of vaginal lacerations in unskilled hands.

High operation;

Lacerations of the cervix, the uterus, the vagina.

Contusions;

Shock.

To the child:—Injury of the brain from excessive compression.

*Application of Forceps:*

Preparatory Measures:

Position:—Dorsal,—the American obstetric position, —the preferred position; the lateral decubitus is permissible;

Passages, instrument and operator's hands and arms must be aseptic;

Canalization of the cervix should be complete, or nearly so ;

The membranes should be ruptured;

Correct malpositions if possible;

Empty the bladder and rectum;

Anæsthetic,—chloroform, ether, or a fresh A. C. E. mixture.

Application:

Apply the left blade first,—on left side of pelvis.

Seize the handle with the thumb and finger of the left hand, holding it nearly in a vertical line.

Pass two or more fingers of the right hand between the head and the left wall of the passages, the palmar surface inward.

Pass the blade along the palmar surface of the right hand and between the head and the walls of birth-canal, observing both the pelvic and the cranial curves, hugging the head.

Pass the right blade in similar manner, the left hand serving as a guide.

Adjust the blades in the best possible seizure.

Locking. If the arms do not lock readily, readjust the blades till they do. Never force the locking.

*Extraction:*

Traction should be intermittent,—a pull and a pause. Unlock the arms in the intervals to relieve pressure on the head.

*Line of Traction:*

Apply the force in the direction of the birth-canal. In order to this, grasp the handles with one hand and apply downward pressure with the other resting upon the shanks near the lock. With forceps of moderate pelvic curve, simple traction suffices after the head reaches the pelvic floor.

The direction is practically a straight line parallel with the posterior surface of the symphysis pubis till the head reaches the pelvic floor.

The line of traction should then turn almost directly forward.

Sweep the handles upward till the anterior edges of the blades hug the ischio-pubic rami as closely as possible without crushing the intervening soft parts.

Amount of force, from 10 to 80 lbs.

Time is an important element in a safe forceps extraction. The resistance of the moving body, and therefore the violence to the maternal soft parts, increases as the square of the rate of motion.

At least a half hour should be consumed in a low forceps delivery; more in a high operation.

*Perineal stage:*

The forceps may or may not be removed.

Take a half hour or more for the perineal stage of the delivery.

*Advantages of the Tarnier forceps, in high operations.*

Axis traction, minimizing the traction force by applying it to the best advantage.

Mobility of the head, permitting rotation.



**Version.**

**Definition.**—The complete or partial inversion of the fœtal ovoid, by manual interference,—substituting the cephalic or pelvic pole for a less favorable presentation.

Cephalic version causes the head to present;  
Podalic, the feet.

*Indications:*

Cephalic:

Certain breech cases before labor;  
Certain shoulder presentations.

Podalic:

Certain cases of moderately flattened pelvis;  
Most cases of placenta prævia;  
Certain cases of prolapsus funis;  
Rupture of the uterus;  
Difficult Face Cases, brow, complex presentations;  
Most shoulder presentations;  
For rapid delivery in emergencies, and in certain other cases.

*Methods:*

External;  
Bipolar;  
Internal.

*Dangers of Version.*

To the mother,—External and bipolar, practically none, as a rule.

Possible rupture of the uterus in difficult cases.

Internal. Increased risk of sepsis,—preventable.

In all, increased danger of lacerations in rapid extraction, and of shock.

To the child:—As in spontaneous breech birth, also,

Fracture of bones;

Compression of the spine in internal version.

**External Version.***Indications:*

Breech presentations,—before labor;  
Shoulder presentations.

*Method:*—External manipulation,—one hand over each foetal pole; push the head toward the occiput, the breech toward the feet.

A combined external and internal method may be substituted for the external,—one hand over the abdomen, two fingers of the other in the vagina.

### **Bipolar Version.**

#### *Indications:*

Placenta prævia in certain cases;

In all cases where version is indicated the bipolar should be preferred to internal version, if practicable.

#### *Advantages, over internal version:*

A minimum of traumatism and shock.

Lessened danger of infection.

May be done early in the first stage of labor.

#### *Method:*

Dorsal or knee-chest position, one or two fingers of one hand through the cervix,—other hand over the opposite foetal pole externally;

Push the breech toward the side on which the feet lie;

Toss the head out of the excavation into that iliac fossa toward which the occiput points;

Toss the trunk in the same direction inch by inch till the knees present;

Draw down a knee or the knees and feet.

### **Internal Version.**

*Application.* All cases of version in which the other methods are impracticable.

#### *Method:*

Dorsal or knee-chest position.

Protect the clothing of the operator with a sheet or long apron.

Pass the hand into the uterus over the abdomen of the child, palmar surface toward the child.

Seize the remote foot and invert the foetal ovoid by traction.

The internal manipulation may be assisted if necessary by the other hand externally.

#### OBSTETRIC SURGERY OF THE ABDOMEN.

##### Definitions:

Laparotomy: Gastrotomy.—Opens the abdominal cavity.

Laparo-Hysterotomy: Gastro-Hysterotomy: Cæsarean Section.—Opens the abdominal cavity and also the uterus.

Laparo-Hysterectomy: Gastro-Hysterectomy: Porro Operation.—Opens the abdominal and uterine cavities and includes the amputation of the uterus.

Laparo-Elytrotomy: Gastro-Elytrotomy.—Opens into the vagina, through the abdominal wall above Poupart's ligament, avoiding the peritoneum.

Pubiotomy.—Divides the symphysis pubis.

#### Laparotomy: Gastrotomy.

##### *Indications:*

Rupture of the uterus,—in most cases.

Extra-uterine pregnancy after rupture;

Certain cases of extra-uterine pregnancy before rupture.

##### *Operation:*

Consists in opening the abdominal cavity,—generally in the median line,—removing its foreign contents, arresting hemorrhage, cleansing and closing the cavity.

#### Cæsarean Section: Hysterotomy: Laparo-Hysterotomy.

The modern Cæsarean Section has practically supplanted all other methods of delivery by abdominal section, with the single exception of the Porro-Müller operation for certain rare cases.

*History:*

The operation antedates the Christian era;  
The earlier operations, however, were post-mortem  
Cæsarean sections done a few minutes after the  
death of the mother to save the child.  
The earliest recorded case of Cæsarean section  
upon the living subject was done in the year 1500.

*Results of the Modern Operation.*

Mothers saved, 75 to 77 per cent.  
German results, 82 per cent.  
Children saved, 93 per cent.

*Indications:*

Pelvic obstruction sufficient to make embryotomy  
impracticable, conjugate of 2 inches or less, or equiv-  
alent contraction of other diameters.

Pelvic obstruction such that while embryotomy is  
possible it is more dangerous to the mother than  
Cæsarean section,—conjugate of 2 to  $2\frac{1}{2}$  inches.

Cæsarean section is permissible under favorable  
conditions with a conjugate between  $2\frac{1}{2}$  and  $2\frac{3}{4}$   
inches if the mother so elects.

Certain cases of cancer of the cervix.

*Preferred Time for Operation.*

With most authorities, after labor is established.

Anticipate exhaustion.

Before rupture of the membranes there is less trau-  
matism, the child is more certainly alive and ex-  
traction is easier.

Operation before labor permits better preparation,  
the uterus retracts as well and drainage is all-suffi-  
cient or can be made so.

*Preparatory Measures.*

Temperature of the room  $75^{\circ}$  to  $80^{\circ}$  F.

Have ready a supply of boiled water for irrigation  
at a temperature of  $100^{\circ}$  to  $110^{\circ}$  F.

Slightly elevate the head and shoulders. Respira-

tion is thus easier and the tendency to prolapse of intestines is diminished.

Evacuate the bladder.

*Antiseptic Precautions.*

Reinforce the patient's strength before the operation by tonics and hygienic measures.

Move the bowels 2 or 3 times, a day or two before operating if practicable.

Render the room, table and all surroundings of the patient aseptic.

The patient should have a total bath and clean linen. Sterilize the vagina and the cervical canal, the external genitals and immediate surroundings.

Shave the pubes.

Scrub the surface of the abdomen with soap and water, wash with alcohol and finally scrub with a 1-2000 mercuric iodide or bichloride solution.

Wrap the body and extremities warmly with clean flannels except the field of operation.

Cover the clothing about the field of operation with cloths or towels wrung out of the biniodide solution; —or better sterilized by boiling or steaming for half an hour.

Instruments should be sterilized by exposure for half an hour to a temperature of 234 deg. F., or by boiling or steaming for the same length of time.

The hands and arms of the operator and assistants should be sterilized and their clothing covered with fresh laundered operating robes.

*Assistants.*

First assistant to stand on the side of the patient opposite the operator.

One to give the anæsthetic.

A nurse to take charge of the steam sterilizer.

One to receive the child.

*Instruments, etc.*

Scalpel. Blunt-pointed bistoury.

Two scissors, one straight, one curved on the edge.

Broad grooved director.

Tissue forceps.

Six to twelve catch forceps,—hæmostatic forceps.

Needle-holder and needles.

Peaslee's needle.

Long catch forceps for holding the cheese-cloths for sponging.

A finger-thick rubber tubing (four feet long) as a constrictor for the neck of the uterus.

A steam sterilizer for sterilizing cheese-cloths, towels, etc.

Large strong catch forceps for holding the knot of the constrictor.

Twenty catgut sutures, No. 5, for uniting the uterine muscularis.

A catgut suture No. 7, bearing a needle, for continuous suture of the uterine serosa. A similar one for the parietal peritoneum.

A catgut suture, No. 5, for continuous suture of the aponeurosis.

Twelve silk sutures, No. 12, for re-uniting the abdominal wound.

Two dozen cheese-cloth or butter-cloth pads, kept hot in the steam sterilizer.

A 1-2000 solution of mercuric iodide in glycerine.

#### *Summary of the Conditions of Success.*

Timely operation;

Aseptic technique;

Uterine sutures,—deep 9-10,—superficial 18-20, or continuous;

Maintenance of the natural temperature of the abdominal viscera;

The least possible handling of peritoneal surfaces.

#### *Stages of the Operation.*

Median incision of the abdominal wall;

Application of the cervical constrictor;

Median incision of the uterus;

Extraction of the child and placenta and eventration of the uterus;

Toilette of the uterus and peritoneum;

Closure of the wounds and dressing of the abdominal wound.

*Technique of the Operation.*

Abdominal incision from the navel to a point an inch above the symphysis.

Expose the linea alba.

Incise the tendon, cautiously, exposing the subperitoneal fat.

Close all vessels by compression or ligation before opening the peritoneum.

Lift the peritoneum with tissue forceps, nick it with the scalpel or scissors close to the forceps, and extend the incision to the full length of the abdominal wound, using the finger as a guide.

Pass a loop of the constrictor over the fundus and adjust it around the cervix, tightening it only as required to control hemorrhage.

Let an assistant hold the uterus, by means of the constrictor, firmly against the abdominal incision and in central position.

Make a short incision through the uterine wall above the retraction ring.

Lengthen upward with the fingers or scissors, falling short of the fundus.

Separate and push aside the edge of the placenta in case of anterior implantation.

Puncture the membranes and extract the child, preferably by the head.

Prevent liquor amnii and blood from entering the abdomen by pressing the abdominal walls against the uterus.

As the uterus slips out of the abdominal cavity hold back the intestines if necessary with hot moist cloths over the upper portion of the incision, or by provisional sutures.

Keep the uterus wrapped in hot moist cloths.

Remove the placenta and membranes and secure retraction.

Compel retraction by manipulation or by Faradism.

Irrigate the peritoneum if required with plain boiled water, or .73 per cent. salt solution at temp. 105° F.

Hot irrigation of the peritoneal cavity (temp. 105° to 110°) relieves shock.

Avoid irritating the peritoneum by handling, sponging or chemical antiseptics.

Close the uterine wound with nine or ten deep catgut sutures, avoiding the decidua.

Close the peritoneal coat of the uterus with 12 to 20 loops of continuous suture of No. 7 catgut, uniting the edges, or the free surfaces after the manner of Lembert.

Push the omentum above the uterus.

Close the abdominal walls with three layers of sutures; the peritoneum with a continuous catgut suture, No. 7; the tendon with a continuous catgut suture, No. 5; the overlying structures with interrupted silk sutures, No. 12, at intervals of half an inch.

Give ext. ergot fl., half a drachm, hypodermically.

Dress the abdominal wound with several thicknesses of sterilized cheese-cloth wet with the biniodized glycerine.

#### *After-Treatment.*

Promote reaction by artificial warmth,—by stimulants if required.

Maintain a rigid cleanliness.

Catheterize the bladder every six hours for two or three days.

Put the child to the breast as in normal cases.

Begin feeding with light liquid food after 24 or 36 hours.

Remove the abdominal sutures by the 10th or 12th day.

The patient may usually leave the bed at the end of three weeks.



**Porro Operation: Laparo-Hysterectomy.**

First performed by Edward Porro of Pavia, Italy, in 1876. Subsequently modified by Müller.

*Results:* About 54% of mothers saved,—82% of the children.

*Indications:*

- Stenosis of the cervix or vagina impeding drainage;
- Certain tumors of the corpus uteri, as myomata etc.;
- Retrocervical or retrovaginal myomata;
- Septic uterus;
- Hemorrhage after Cæsarean section, or after rupture of the uterus,—not otherwise controllable;
- Pregnancy in a rudimentary horn of the uterus.

*Advantages:*

- Diminished danger of sepsis;
- Prevention of subsequent pregnancies,—an advantage in certain cases;
- Technique simple;

*Technique:*

- Abdominal incision;
- Eventration of the uterus and application of the cervical constrictor before the uterine incision;
- Uterine incision and extraction of the child;
- Application of a wire *écraseur* immediately below the constrictor. *Écraseur* to be left on several days and tightened as stump shrinks;
- Transfixion of the cervix with two or three long pins (knitting needles) just above the *écraseur*;
- Amputation of the uterus  $\frac{3}{4}$  inch above the clamp;
- Removal of rubber constrictor;
- Suture of the abdominal wound, stitching the stump to the peritoneum in the lower angle;
- Ligation of the uterine arteries in the stump;
- Mummification of the stump with liquor ferri perchloridi;
- Dressing.
- Inversion of the stump into the vagina may be substituted for fixation in the abdominal wound.

*Tait's Method.*

Abdominal incision large enough to admit the hand.

Constriction of the cervix with a finger-thick rubber tube,—passing loop over the fundus.

Incision of the uterus and removal of the child and placenta.

Eventration of the uterus.

Pack hot cloths about the cervix to keep blood out of the abdomen.

Transfixion of the cervix by two or three knitting needles passed through the constricting tube and the cervix.

Amputation of the uterus  $\frac{3}{4}$  inch above the constrictor.

Ligation of the uterine arteries.

Suture of the abdominal wound, stitching the stump in the lower angle.

Mummification of the stump with perchloride of iron solution.

Dressing.

**Laparo-Elytrotomy: Thomas' Operation.**

First proposed in the early part of the present century by Joerg, Physic, Sir Charles Bell and Ritgen. First completed operation by Baudelocque in 1843. Revived by Thomas and done by him in February, 1870.

*Results.*

Fourteen operations with 50% of mothers saved.

*Advantages.*

Avoids opening the peritoneum. Unimportant.

*Disadvantages.*

Circuitous route and difficult extraction of the child.

Danger of injuring the bladder.

The modern Cæsarean or the Porro operation is simpler and safer.

*Technique.*

The usual preparatory treatment and antiseptic precautions.

Abdominal incision on either side, parallel with Poupart's ligament, a little more than one inch above it, extending from a point one inch or more above the anterior superior spine of the ilium to a point one and three-fourths inches from the pubic spine.

Go down to, but not through, the peritoneum.

Peel the peritoneum from the transversalis and iliac fasciæ and the posterior vaginal wall, and hold it and the intestines upward.

Isolate and protect the ureter.

Let assistant push the vaginal wall up into the incision by means of the finger or an obturator.

Incise the vaginal wall horizontally with blunt scissors or a cautery knife as far below the cervix as possible.

Mark the lateral limit of the bladder by a sound in the bladder and the finger of assistant in the vagina.

Lengthen the vaginal incision by the finger, mainly backward.

Extract the child through the wound by the feet or by forceps, the fundus being drawn to the opposite side by an assistant.

Deliver the placenta either by wound or vagina.

Inject the bladder with milk and water to detect possible laceration.

Pass one or two perforated drainage tubes through the external wound into the vagina.

Suture the abdominal wound.

Dressing as in Cæsarean section.

During convalescence keep the wound and passages free from septic fluids by irrigation.

### **Pubiotomy: Symphysiotomy.**

#### *History.*

First proposed in 1768. After half a century it became obsolete.

Revived in 1866 by Morisani of Naples, Italy.

#### *Method of Operating.*

Incise the overlying structures down to the symphysis pubis.

Pass a strong curved bistoury from above down along the posterior surface of the symphysis and divide the joint.

After delivery immobilize the pelvic bones with a firm bandage.

*Objections to the Operation:*

- Danger of injuring the bladder;
- Danger of injuring the sacro-iliac joints;
- Possible caries of anterior pelvic wall.

### SACRIFICIAL OPERATIONS.

#### **Embryotomy.**

The general term for all obstetric operations employed to facilitate delivery by lessening the size of the fœtus.

By some writers restricted to operations for reducing the trunk.

*Indications:*

Hydrocephalus too large for safe extraction without perforation;

Certain cases of narrow pelvis,—as an alternative of Cæsarean section, on choice of the mother, conjugate 2 or  $2\frac{1}{2}$  to  $2\frac{3}{4}$  inches;

Obstructed labor with dead or non-viable fœtus, conjugate above  $1\frac{1}{2}$  inches.

#### **Craniotomy.**

An operation for the partial or complete comminution and removal of the cranial bones.

**Steps.**

**1. Perforation.**

Instrument, Smellie's scissors or other perforator, especially the trephine.

Pass the point of the perforator against the head, perpendicularly to its surface, just behind the pubes, using the fingers of one hand as a guide and guard.

Fix the point in the bone by a screw-like motion and perforate in similar manner.

Separate the blades in different directions to enlarge the perforation.

The trephine removes a button of bone.

Break up the brain throughout with the perforator, especially the medulla oblongata.

Wash out the brain substance with a stream of water from a syringe.

2. *Comminution.*

With the craniotomy forceps passed within the scalp, seize the cranial bones one by one.

Break them up and dislodge them one by one, by rotating the forceps about its long axis.

3. *Extraction.*

Remove the bones, avoiding laceration of the passages, till the bulk of the head is sufficiently reduced.

Extract the fœtus by means of the craniotomy forceps, the crotchet or the cephalotribe.

**Cephalotripsy.**

An operation for crushing the cranial vault.

Lusk's the best cephalotribe.

Extraction may be accomplished by means of the cephalotribe or a powerful craniotomy forceps like Braun's so called cranioclast,

**Decapitation or Decollation.**

Called for in certain cases of impacted shoulder presentation.

*Method*, vide p. 120.

**Evisceration.**

Includes all operations for reducing the size of the trunk by removal of its viscera.

## PATHOLOGY OF THE PUERPERIUM.

**Mammary Abscess.***Causes:*

## Predisposing:

- Bad general health;
- Milk stasis;
- Lesions of the nipples.

## Exciting:

- Sepsis.

*Forms:*

- Subcutaneous;
- Glandular: Mastitis or Parenchymatous Mastitis;  
In the great majority of cases a lymphangitis;
- Subglandular: Paramastitis.
- Two or all forms may coexist.

*Diagnosis:*

## Subcutaneous Form.

- Signs of ordinary phlegmon;
- Generally single.

## Glandular Form.

- More pain;
- More constitutional disturbance;
- Generally ushered in by a chill;
- Induration of the gland;
- Often multiple.

## Subglandular Form.

- Pain deep-seated;
- Gland not indurated;
- Gland floats on the underlying fluid;
- Pass an exploring needle beneath the gland.

*Treatment.*

## 1. Prophylactic.

- Massage in simple milk engorgement,—without inflammation.

Tonics, especially quinine.

Aseptic management and curative treatment of nipple lesions.

2. Abortive.

Absolute rest, in true mastitis.

A saline cathartic.

Oleate of atropia locally,—with care lest the secretion be too much repressed.

Support by a sling with equable compression.

Quinine.

3. Treatment of Suppuration.

Open early and freely, with antiseptic precautions.

Incision should radiate in a direction from the nipple, avoiding the areola.

Counter-opening if necessary for drainage.

Antiseptic irrigation frequently repeated. Peroxide of hydrogen the best antiseptic for the purpose.

Antiseptic dressings.

Compression to keep the walls of the abscess cavity in contact.

### **Puerperal Eclampsia.**

*Definition:*—Eclampsia during pregnancy, parturition or the puerperal period, from causes pertaining to the gravid, the parturient or the puerperal condition.

*Frequency,* 1-500.

Most frequent in primiparity, twins, excess of fat.

Occurs more frequently in pregnancy or labor than in the puerperal period.

*Causes:*

The puerperal condition.

Peripheral irritation.

Uræmia (so called) the chief cause,—the toxic material acting upon the convulsive and the vaso-motor centers.

The uræmia is due to acute parenchymatous or, in a certain proportion of cases, chronic nephritis, or to acute supervening upon chronic.

Doleris and Butte have found toxic ptomaines in the blood of eclamptic patients.

The chief immediate cause of the convulsions is acute anæmia of the brain from vaso-motor spasm of the cerebral vessels.

*Premonitory Symptoms and Signs:*

Œdema, especially of the face;

Debility;

Headache, generally frontal,—suboccipital rarely;

Nausea or other digestive disorders;

Visual disturbances;

Epigastric pain;

Albuminuria;

Casts.

*Differential Diagnosis.*

Distinguish from hysterical convulsions, epilepsy, apoplexy.

*Clinical History.*

Symptoms already referred to.

Eyes fixed.

Spasmodic movements, first of the facial muscles, then becoming general.

Convulsion at first clonic then tonic.

Asphyxia and cyanosis from tonic spasm of the respiratory muscles.

Frothing at the mouth, generally bloody.

Duration, one or two to five minutes, rarely longer.

Coma follows, usually subsiding within half an hour.

Intervals, from a few minutes to several hours.

Pulse, 100 to 140 deg. F.

Temperature varies in different cases from normal or subnormal to 105° F., or more.

*Prognosis.*

Graver the earlier the attack in pregnancy or labor.

Danger increases with the number of seizures.

Recovery is rare after a temperature of 105° F.

Impairment of the mental faculties sometimes follows.



*Mortality:*

Maternal about 30%,—from

Slow asphyxia during convulsion;

Cerebral hemorrhage or congestion.

Fœtal about 50%,—from

Asphyxia, apoplexy or lesions of the cord;

High temperature.

*Treatment.**Prophylactic.*

Treatment of the nephritis.

Milk diet.

Saline cathartics.

Diaphoresis.

Dry cups over the kidneys.

Digitalis and saline diuretics.

Bromides or chloral if required as prophylactics against convulsions.

Ext. veratri viridis fl. (Squibb), 3 to 6 minims, t. i. d., or to keep pulse below 70,—for the same purpose.

Iron as a restorative.

Induction of labor in cases that do not yield promptly.

Acceleration of the labor, cautiously.

Chloroform during labor, as an anti-eclamptic.

*Remedial.*

Chloroform, by inhalation.

Ext. veratri viridis fl. (Squibb), 10 to 20 minims hypodermically; repeat every half-hour till the pulse is below 60 to the minute.

Catharsis:

Calomel and salines;

Elaterium (Merck),  $\frac{1}{4}$  gr.; or

Ol. tigii, 1 or 2 minims.

Wet cups over the kidneys.

Chloral, 20 to 40 gr., and bromides  $\frac{1}{2}$  to 1 drachm, p. r. n.

Morph. sulph.,  $\frac{1}{2}$  to  $1\frac{1}{2}$  gr., hypodermically.

Nitroglycerine,  $\frac{1}{8}$ th gr.

Nitrite of amyl, 5 minims, by inhalation.

Inhalation of oxygen.

Accelerate the labor. Induce labor if not spontaneously established.

*Restorative.*

Iron and general tonics.

**Puerperal Insanity. Insanity of Pregnancy, the Puerperium and Lactation.**

*Causes:*

Heredity;

Bad mental hygiene;

Anæmia;

Septic infection. — Distinguish from the transient delirium of septicæmia.

*Prognosis.* Generally favorable.

*Treatment.*

Mental and physical hygiene.

Iron, pil. Blaud, 1 or 2, t. i. d.

Arsenious acid, gr.  $\frac{1}{30}$ th t. i. d.

Arsenate of iron, gr.  $\frac{1}{60}$ th t. i. d.

Hyoscyamine in maniacal forms, gr.  $\frac{1}{30}$  p. r. n.

Morphia, cautiously, in melancholia.

Treat infection as in other cases.

**Puerperal Fever: Puerperal Septicæmia.**

*Frequency.*

In absolutely aseptic practice, nil. In well managed, isolated maternities, less than half of one per cent. of puerperal women die from sepsis.

In general private practice without antiseptics there is little less than one per cent. of fatal cases.

In pre-antiseptic times "epidemics" were frequent with a death rate of three to ten per cent. or even more.

More frequent in primiparæ; than in multiparæ.

*Etiology.*

Cause, septic infection. Lowered resisting power favors.

### Sources of Infection:

Cadaveric and other dead and decomposing animal matter;

Lochia of puerperal fever patients;

Secretions from suppurating or erysipelatous wounds;

Diphtheria or scarlet-fever in certain cases owing to complications involving the presence of wound infection germs;

Idiopathic erysipelas.

Self-infection (auto-infection) in the strict sense of the term does not exist.

### Vehicles of Infection.

The hands of the physician or nurse, instruments, utensils, cloths, germ-laden dust, etc.

### Avenues of Absorption.

The obstetric wounds.

Of lower uterine segment, placental site, in fact the entire cavity of the uterus.

Lacerations of the cervix, vagina, introitus.

Even intact surfaces of the genital mucosa.

### Channels of Diffusion.

Lymphatics and to some extent the veins.

### Bacteriology.

The organisms most frequently found are

The streptococci,—chain cocci.

Staphylococci are occasionally found.

The rod-shaped bacteria of putrefaction are generally present. Putrefaction of lochia furnishes a favorable soil for the development of pathogenic organisms.

Certain other microorganisms are believed to be possible factors in the pathogeny.

Putrefaction play an important role in the pathogenesis.

### *Pathology,*

Endometritis;—may lead to salpingitis and ovaritis.

Metritis.

Para-metritis.

Perimetritis or pelvic peritonitis.

Diffuse peritonitis.

Uterine lymphangitis and phlegmonous lymphadenitis;—generally attended with peritonitis.

Phlebitis, uterine, para-uterine, and crural.

Colpitis.

Pure septicæmia;—Acute ptomaine poisoning. Putrid intoxication.

Other remote lesions; *e. g.*, pneumonia, pleurisy, pericarditis, endocarditis, nephritis, arthritis, subcutaneous phlegmons and others.

### *Prognosis.*

As a rule the earlier the attack the graver the prognosis.

Most unfavorable in acute putrid intoxication, purulent peritonitis, pyæmia.

### *Diagnosis.*

#### *General Symptoms of Infection.*

First symptoms generally developed on the second or third day, rarely later than the fourth or fifth, since the obstetric wounds have by that time begun to granulate.

The majority of cases begin insidiously.

The attack is frequently ushered in by a chill or slight chilliness.

The most prominent early symptoms are a rise of the pulse,—100 to 140,—elevation of temperature,—102° to 104°, F., fetid lochia.

Eliminate malarial pyrexia (by quinine), constipation, emotional, mammary and other non-septic causes.

#### *Symptoms of Special Lesions.*

##### ENDOMETRITIS:

Painful and prolonged after-pains;

Cervix more patulous than normal for the time;

Cavum uteri containing putrilage;

Prolonged bloody flow;

Involution retarded.

**METRITIS:** The same condition as in simple endometric inflammation together with œdematous swelling of the uterus.

**PARAMETRITIS:**

Localized pain and tenderness;  
Exudate in one, possibly both broad ligaments;  
Uterus displaced and partially fixed;  
Fluctuation if pus forms.

**PERIMETRITIS:**

Pain and local tenderness usually intense;  
Uterus becomes fixed;  
Tumefaction in vaginal vault;  
Moderate tympanites;  
Frequently, nausea;  
Lochia scanty.

**DIFFUSE PERITONITIS:**

Exquisite pain in the early stages;  
Tympanites extreme;  
Vomiting of greenish fluid;  
Later, shock and collapse.

**VULVAR LYMPHANGITIS:**

Local tenderness and swelling;  
Swelling of superficial inguinal glands;  
Red streaks in the skin, leading from the vulva to the groin.

**UTERINE LYMPHANGITIS:**

Pain, tenderness and swelling of the uterus;  
Frequently associated with signs of peritonitis.

**UTERINE PHLEBITIS:**

Irregularly recurring chills;  
Marked oscillations of temperature;  
Absence of local tenderness and swelling in pure phlebitis;  
Metastatic affections of remote organs.

**PHLEGMASIA ALBA DOLENS:**

**Thrombo-Phlebitic Form:**

Develops several days or even weeks after delivery;  
Is generally preceded by signs of pelvic inflammation or some form of sepsis;

Pain in the affected limb;  
 Limb becomes swollen, tense, hard, white, glistening;  
 Affected veins felt on palpation as hard irregular cords, owing to thrombi.  
 Resolution begins after about two weeks.  
 Duration may be many weeks.  
 There remains more or less œdema in standing or walking with impairment of muscular power, in a certain proportion of cases lasting for months.

#### Cellulitic Form.

Characterized by inflammation, suppuration and necrosis of connective tissue.

COLPITIS:—Signs of inflammation, simple catarrhal, ulcerative, diphtheritic;

Labia often œdematous in ulcerative vaginitis.

#### PURE SEPTICÆMIA:

Characterized by pyrexia with absence of perceptible lesions;  
 Countenance sallow, sunken, anxious;  
 Occasionally delirium or coma;  
 Diarrhœa and vomiting, dark grumous ejecta.  
 Runs a rapid course, frequently terminating within a few days.

In most cases of puerperal fever several of the lesions above described coexist.

#### *Treatment.*

##### Prophylactic.

##### Prevent infection:

By careful disinfection of the hands, instruments, utensils etc., before each contact with the genitals;  
 Cleanse the external genitals in like manner before examination;  
 Disinfect the vagina and cervix before labor for cause;  
 Examine, per vaginam, as seldom as possible;  
 In most cases vaginal examination may, when

special care is required, be omitted altogether;  
Avoid all preventable injury to the passages.

### Remedial.

#### General Treatment of Infection.

Catharsis,—hydrarg. chlorid, mit., 10 to 20 gr., and a saline. Repeat p. r. n.

Dislodge the enemy and reinforce the resisting powers of the patient.

Vaginal douche, 1-1000 hydronaphthol, or 1-2000 bichloride or biniodide of mercury. A safe and most efficient germicide for the purpose is the peroxide of hydrogen in full or half strength.

Wash out the mercurial solution with a final injection of plain boiled water.

If the pyrexia is not relieved within twelve hours douche the uterine cavity with one of the above-named solutions of half strength, following with a plain water injection.

This failing, the uterine cavity being septic, immediately remove all necrotic material with a large dull curette and antiseptic douche.

Support the patient with tonics, stimulants (maximum dose one quart of brandy or its equivalent daily), and forced alimentation.

#### Treatment of Peritonitis.

Hydragogue cathartics with large stimulating enemata, to procure several copious evacuations daily; to be continued, p. r. n.

Moderate doses of opium if required to control pain.

Local antiseptic measures if indicated.

Dietetic supports, tonics and stimulants.

In purulent peritonitis, open, irrigate and drain the peritoneal cavity.

#### Treatment of Parametritis.

Hot vaginal douches, several gallons, temp. 110 to 120 deg. F., two or three times daily.

Antiseptic and general treatment as above indicated, except the curette.

Pelvic abscess, evacuate early and drain, by the vagina or the abdomen as the indications in the case may require.

#### Treatment of Colpitis.

Irrigate several times daily with 2½% solution of creolin, chlorinated soda 1 in 10, peroxide of hydrogen.

Touch necrotic patches with liq. ferri perchlorid., tr. iodine, or 50% sol. zinc. chlorid.

#### Treatment of Phlegmasia Alba Dolens.

Keep the limb at rest in a horizontal position.

Subdue pain by the local application of morphinæ oleas.

Avoid massage.

The patient may leave the bed when the swelling subsides.

From that time should use support by means of an elastic (flannel) bandage or elastic stocking.

### Causes of Sudden Death in Childbed.

**Shock.** Treatment:—Combat with alcoholic stimulants, atropia, external warmth, rectal injections of hot water.

**Syncope.** Treatment:—Lower the head; give diffusible stimulants.

**Embolism and Thrombosis.** Cerebral embolism. Thrombosis of pulmonary artery.

Treatment, expectant,—absolute rest.

**Air Embolism.** For prophylaxis avoid introduction of air into the passages and keep the patient in the dorsal decubitus for a few hours after delivery.

**Acute Pulmonary Edema.** Treatment, hypercatharsis; hypodermic use of digitalis.

**Non-Puerperal Causes.** Apoplexy; cardiac disease with advanced valvular lesions, especially mitral stenosis; myocarditis, and other causes.

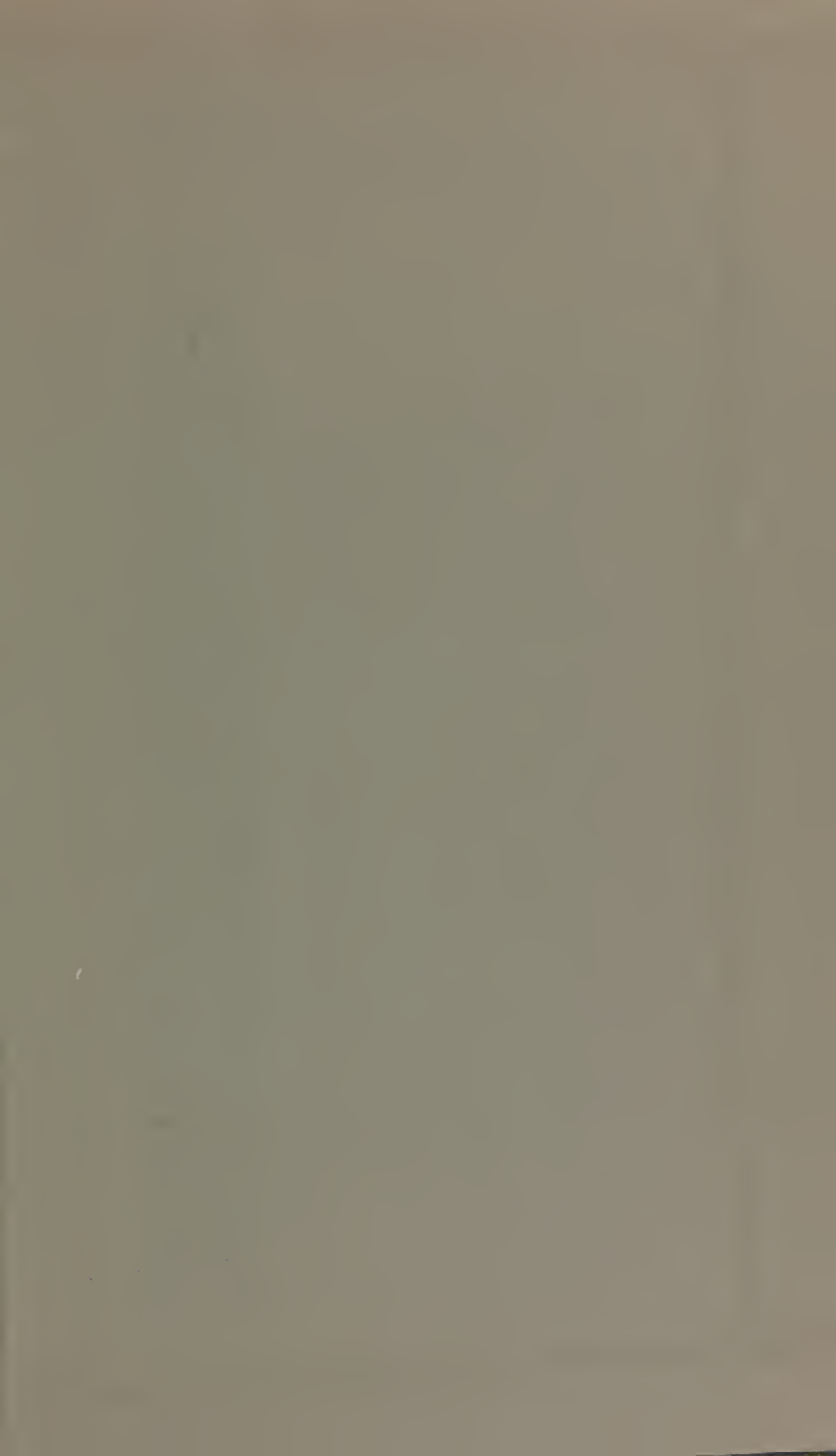




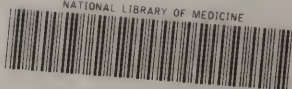








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